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BLOOD-GROUP, M-N TYPE AND Rh TYPE FREQUENCIES IN NEW CALEDONIANS AND THE LOYALTY AND PINE ISLANDERS.

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WITH AN APPENDIX,

"SIMPLIFIED CALCULATIONS FOR THE ESTIMATION OF GENE FREQUENCIES FOR THE RHESUS FACTOR AND AN APPLICATION TO PARTIALLY CLASSIFIED DATA",

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ALTHOUGH the native inhabitants of New Caledonia and the nearby Loyalty Islands have been the subjects of anthropological discussion from time to time, only one blood group investigation on natives within that area has been reported. Languillon (1946) published the results of A-B-O blood groupings only of certain ethnic groups found in New Caledonia.

In view of the Australomorphic characteristics exhibited in varying degree by the present-day population, it seemed of particular interest to determine in what way more complete blood group frequencies supported one or other of the theories that have been advanced concerning the racial origin of the New Caledonians.

It was for this purpose that one of us (J.A.) in February, 1946, when about to proceed to New Caledonia with the Geological Mission of the *Office de la recherche scientifique coloniale française*, obtained an assignment from the Museum of Natural History, Paris. With the same objective in view, another of us (R.T.S.) took steps independently in June, 1946, with the Governor of New Caledonia to make a similar survey. As cooperation was logically indicated, a joint investigation was carried out from October, 1946, to January, 1947. The blood samples were collected from selected individuals according to the restrictive sampling technique outlined below, and forwarded by air to Melbourne for testing.

This paper presents the results of the investigation, which covered the frequencies of blood factors A_1, A_2, B, O, M, and N, together with the Rh type frequencies in what may be considered to be a representative sampling of the above-mentioned peoples.

To permit more adequate interpretation of the results, a brief recapitulation of some of the expressed opinions on the affinities of these and related peoples appears necessary.

Over the last fifty years, various French authors (including Bernier, 1899) have stressed the affinity between the Australians and New Caledonians from the ethnological point of view. The morphological data of Sarasin and Roux (1922) disclosed a high degree of platyrrhiny and a low cephalic index of the northern New Caledonian, characters usually associated with the Australian aborigines.

Howells (1937) made a detailed examination of existing anthropometric and ethnological data in the hope of finding, outside the Australian continent, racial groups exhibiting Australoid characteristics. Included in the scope of his investigation were all peoples who, according to some metrical, facial, cultural, or geographical criterion, might be presumed to have affinity with the Australian.

He discussed races existing today in Melanesia, Indonesia, the Malay Peninsula, the Philippines, Ceylon and India, effectively covering the migration route from Asia to Australia and the southern Pacific. He came to the

conclusion that "the people of northern New Caledonia stand closer in measurements to the Australian than any Melanesian group so far reported".

He inclines to the view that the northern New Caledonian is partly Australian and partly Malayo-Polynesian—the latter influence being evident in the language spoken (Melanesian). The presence of Polynesian languages in the Loyalty Islands is suggested as being responsible for the brachycephaly of the southern New Caledonian.

The main conclusion of Howells was that the Australians were a "pure" and homogenous race representing an earlier stage in the development of *Homo sapiens* than does any other existing race. Prior to Howells's publication it had been postulated that the Australian aborigines were a mixed race having as components a semi-white race related by many characteristics to the Ainu of Japan, and at least two dark strains, one of which was of small stature and one tall.

Dr. J. B. Birdsell, formerly of the Peabody Museum, Cambridge, Massachusetts, has reexamined the question. In a private communication (1947) to one of us (R.T.S.), which he has kindly permitted us to quote, he expressed views on the Australian which differ considerably from those of Howells (Simmons and Graydon, 1948). Birdsell has evidence that three major groups contributed to the composition of the present aborigines: (*a*) Negritic, (*b*) Murrayian and (*c*) Carpentarian. He considers that Oceanic Negritos were the first to reach Australia, followed by Murrayians, an ancient basic white race, closely allied to the Ainu of Japan. The last to arrive were Carpentarians, a tall, linear, dark race, which, like the other two groups, may be traced back to the Asiatic mainland, where its closest affinities are with the Vedda of Ceylon and the Munda of India. It is basic in all the dark-skinned peoples of India and is predominant in the northern half of Australia.

Regarding the basic groups represented in the racial complexes of New Guinea and Melanesia, Birdsell in the same communication writes:

> (*a*) Negritos. This is the dominant element in the islands in contrast to Australia where it is clearly in a minority. This difference is best accounted for by cultural selection resulting from the rainforest environment of the island area opposed to the largely grass land composition of the continent to the south.
>
> (*b*) Murrayian. This basic white element is present in the refuge areas throughout much of Melanesia and New Guinea. It is never predominant over the earlier Negritics, save in one area (the interior of Northern New Caledonia, in the districts of Pamboa and Bonde). It is also found in simple combination with Negritic elements in the high plateau country of the Central Range, New Guinea, from the Doorman-top in the west to Mt. Hagan in the east, and in the interior of the Gazelle Peninsula, New Britain, as among the Baining and similar people.[1]
>
> (*c*) Carpentarian. The presence of these people can best be detected among the tribes of the northern and southern coastal regions of New Guinea. Wherever found, they are much mixed with the preceding two elements. Even so, like the other two major elements, they seem to have reached New Caledonia.
>
> (*d*) Malayo-Polynesian. This term is being used loosely to cover the Mongoloid peoples who came into Oceania at a relatively late date. In Fiji and New Caledonia it probably refers to real Polynesian influences, whereas in New Guinea both Indonesian and Malay contacts are also present. Melanesian-speaking tribes usually show some of this admixture.

NEW CALEDONIA.

From the anthropological viewpoint the natives of New Caledonia are characterized by the following main features. They are of medium height, thick-set, with well-developed muscles, especially the thigh muscles, and with long woolly hair forming a really shaggy mane more like that of the Papuan than the very short hair of the African Negro. Another characteristic is that the hair very often starts to become curly only at the age of three to five years, whereas the Africans show this feature early. Dolichocephalic heads are quite general with more or less receding foreheads, very pronounced brow ridges, massive faces often with protruding cheekbones very much developed, thick uncurved lips, chin more or less receding, nose very broad, often concave, but rarely convex as in the Papuans. No actual pygmoid group exists in New Caledonia. As can be seen, morphologically the natives show many characteristics in common with the Australians. Apart from these general characteristics the great variety of individual types indicates composite origin or evolution from little differentiated stock.

Consideration of the published works of Bernier, Sarasin and Roux, Leenhardt, Rivet, Valois, and others, and personal observations led one of us (J.A.) to express his opinion to the co-authors in 1946 that the principal racial components in New Caledonia are as follows: (i) A component originating from an Australian or Australoid group, which migrated from the north-east either shortly after the populating of Australia or possibly later after the formation of subgroups. (ii) Melanesian components originating probably in the south of Asia. It appears that at least two distinct migrations have taken place, one of a dolichocephalic people of small build and very dark skin who covered the whole of Melanesia, the other, very much later, effected by men with a lighter skin, wavy hair, and less broad nose. (iii) Polynesian components, very evident in the Loyalty Islands (in Ouvea a whole tribe is known which came in historical times from Wallis Island) and in the south and east of New Caledonia.

The admixture in different proportions of these components might have given the different insular types of Melanesian peoples in general and of New Caledonians in particular.

A somewhat similar but more precise theory concerning the components of the New Caledonian was advanced by Birdsell in the aforementioned private communication. His views were based on a review of the publications of prior authors and a careful study of the excellent monographs of Sarasin and Roux. His tentative analysis of the racial complex in New Caledonia was as follows:

> All four of my major racial groups are present in the island with the underlying Negritic present everywhere, but less dominant than in most other islands in this region. The northern interior area of Pamboa and Bonde seem to contain a simple mixture of Negritic and Murrayian elements and are unique in Melanesia in that there the Murrayian is clearly dominant. The rest of the island is populated by more complex mixtures. The whole northern half (really north-western half) can be called trihybrid, since to the earlier Negritic and Murrayian elements have apparently been added some Carpentarian. The south-eastern half of the island is even more complicated, for in addition to the above three elements, there is clearly present a Malayo-Polynesian admixture, which is most marked on the coast, but none the less penetrates well into the interior of the south-eastern portion of the island.

These theories afford a logical explanation of the great variety of phenotypes seen in New Caledonia, amongst which is the remarkable phenotype of the "rusty natives" encountered in the Pamboa area and sporadically in other places, whose characteristics are very like those of white persons; this phenotype may be due to the Murrayian influence suggested by Birdsell.

The real unity of each of the components and their relative importance is still a matter for discussion, as is also the suggested order of their arrival in New Caledonia.

It may be added that independently of the anthropological data there are archæological and linguistic facts indicating the existence of a prehistoric era in New Caledonia. The existence of numerous petroglyphs, the significance and origin of which are quite unknown to the present-day natives of New Caledonia, may be cited as an example. Further evidence of a prehistoric era may be seen in the discovery by one of us (J.A., 1946, unpublished) of fragments of pottery different in type from actual aboriginal potteries. These were found at a depth of 23

[1] The anthropological conclusions of Birdsell support those of some ethnologists who have shown cultural affinities between the Ainu, the Australians and Oceanic peoples (Sternberg, 1929, and P. Rivet, 1933). The latter author wrote: "I incline to think that the Ainu people, formerly masters of the whole of Japan, are the true Oceanians."

feet in alluvial deposits of the Moindou River, where typically Canac potteries have never been found at a depth greater than 11 feet.

MATERIAL AND METHODS.

Sampling.

The total native population of the islands of New Caledonia is approximately 32,000, of which about 18,000 are in New Caledonia, 12,000 in the Loyalty Islands, and the remainder in lesser islands. These natives belong to tribes which are grouped in districts for administrative purposes. They speak about twenty different languages. Some tribes are reduced to a few score individuals, others consist of hundreds. A great number of the tribes of the south were annihilated in the revolt of 1878.

In the collecting of samples "pure blooded" natives only were selected; those showing morphologically recognizable signs of admixture, or known to be of mixed blood, were rejected. Whenever possible samples were taken from adults, and in no case was more than one member of a family included in the series. Further, within each tribe samples were obtained from one member only of each clan or *Moiro*. The aim of these restrictions was to eliminate as far as possible errors due to inclusion in the sampling of undue proportions of related individuals. A sampling in which adults only are included is not strictly representative of the present-day population, but rather tends to become representative of the population as it was, say, twenty years earlier. By further restriction of the selection to one adult member of each family or clan, so that no two individuals in the series are closely related, the sampling approaches representation of the population as it was a generation still earlier—that is, say forty to fifty years prior to the date of examination—a significant advantage in anthropological investigations of living subjects. The efficiency of the sampling technique may be gauged from Table I, which gives the population statistics for each of the groups considered, and from the map (Figure I), which gives the location of the districts in which samples were collected.

It will be seen that of a total adult population of 18,000, 558 individuals have been tested, slightly over 3%. Because the average number of adults per family is certainly greater than three, and samples were never taken from more than one member of each family, it may be assumed that at least 9% of the native families of New Caledonia are represented in the sampling. Also 53% of the existing tribes have representation in the series.

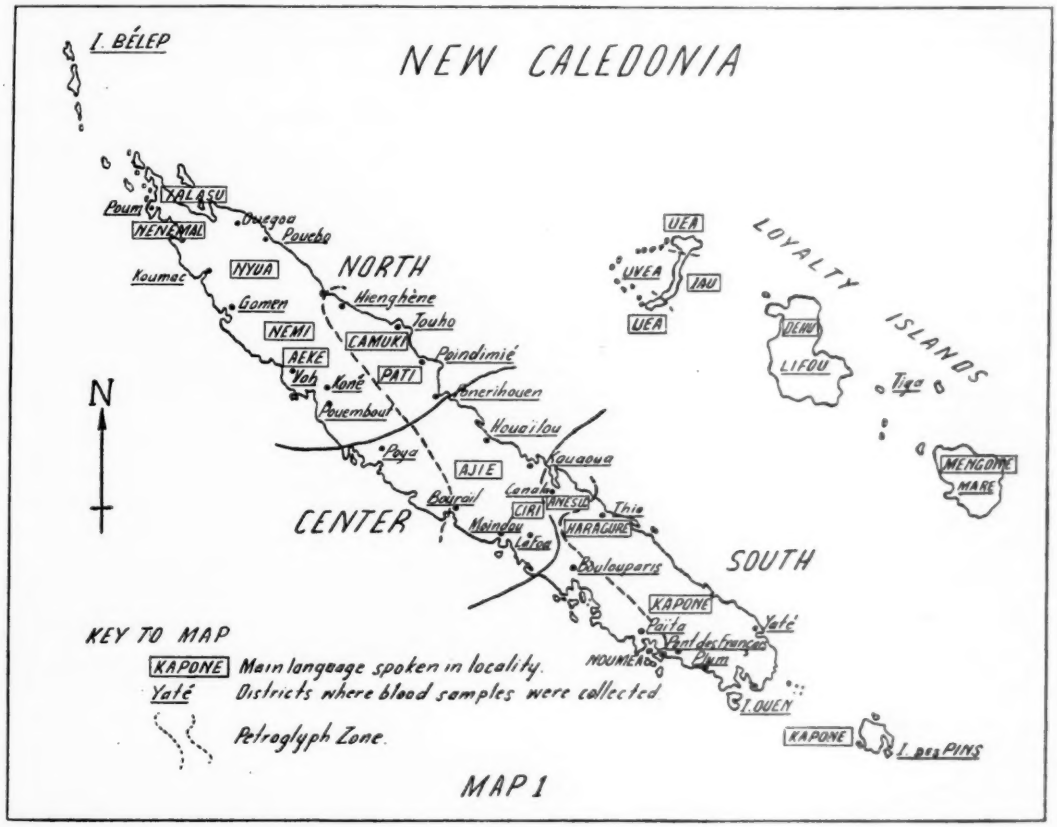

FIGURE I.

Each of the two lots of samples consisting of two drops of blood taken into small rubber-stoppered bottles containing one millilitre of sterile glucose-citrate preserving solution (Simmons and Graydon, 1945) were collected by one of us (J.A.) while moving from district to district over a period of two to three weeks, during which time they were stored on ice. They were returned by air to Melbourne in ice-packed "Thermos" flasks and were tested within three days of receipt. The first lot arrived in perfect condition; but unfortunately the flask containing the second lot was broken in transit, and a number of samples had to be discarded owing either to hæmolysis or to pan-agglutinating properties in the cells.

A slide technique previously described was used throughout this investigation. Human serum of high titre was selected for the determination of the groups; for the subgroups an absorbed human serum which gave strong agglutination with A_1 and A_1B cells at room temperature,

TABLE I.
Showing Tribal Details and Number of Blood Samples Tested.

District.	Number of Natives Over Fifteen Years of Age.[1]	Total Number of Tribes in Area.	Number of Tribes Represented in Sampling.	Number of Languages Spoken.	Number of Districts where Samples were Collected.	Number of Blood Samples Tested.
North	5,989	139	58	9	12	198
Centre	1,993	50	30	2	4	110
South	2,348	44	26	3	7	92
Pine Island	422	8	8	1[2]	1	48
Loyalty Islands	7,265	84	51	4	7	110
Totals	18,017	325	173	18	31	558

[1] The total native population of New Caledonia, the Pine and Loyalty Islands and adjacent islands is about 32,000.
[2] Kapone, the language spoken in Pine Island, is also used in southern New Caledonia.

but no agglutination with A_2 or A_2B cells was chosen. The potent and specific anti-M and anti-N testing fluids used were prepared by absorption of the sera of immunized rabbits (Simmons, Bryce, Graydon, and Wilson, 1941). The anti-Rh type sera were the same as those used in a previous investigation (Simmons and Graydon, 1948) The reactions of the various Rh antigens with type antisera and several of the suggested nomenclatures have been discussed in an earlier paper (Graydon and Simmons, 1946). In this paper we have adhered to the nomenclature used previously in our racial investigations. All samples were tested against the three types of anti-Rh sera, but unfortunately it was not possible for this to be done with anti-Hr′ (anti-c) serum owing to lack of supplies of this reagent. For the Hr tests a more or less random selection of 325 samples was made from the total collection. These, together with the 36 samples not in the random selection which gave positive reactions with all three of the anti-Rh sera, were tested with the anti-Hr′ serum.

Results and Discussion.

The results of the determination of blood groups and M,N types of 558 individuals of New Caledonia, Pine Island and the Loyalty Islands are summarized in Table II, which also separately lists these statistics for five regional subdivisions. These subdivisions have been chosen either on obvious geographical grounds or after consideration of accumulated ethnic evidence of the inhabitants. The boundaries of these divisions and the districts where samples were collected are shown in the map (Figure I), which also indicates the zone in which petroglyphs have been found. The areas in which the main languages are spoken are indicated by the appropriate framed names.

As has been reported for all previously investigated racial groups of the south-west Pacific area, no individual was found amongst those possessing the A factor who belonged to the subgroups A_2 or A_2B.[1] The New Caledonian evidently has no appreciable component of races possessing the A_2 factor, which further differentiates him from the African Negro in whom the frequency of subgroup A_2 is relatively high.

Of the 558 samples examined, 298 (53·4%) were of group O, 190 (34·1%) were of group A_1, 50 (9·0%) were of group B, and 20 (3·6%) were of group AB, results substantially in agreement with those of Dr. Languillon. Gene frequencies calculated from these figures were as follows: $p = 0{\cdot}204$, $q = 0{\cdot}059$, $r = 0{\cdot}731$; the value for D was thus $0{\cdot}006$ $(=1-p-q-r)$, with a standard deviation (σ_D) of 0·0038, from which $D/\sigma_D = 1{\cdot}6$. Neither this value nor the corresponding D/σ_D value for the M,N system discloses any systematic technical or sampling error in the series.

The Rh results are presented in Tables IIIA and IIIB. Only three phenotypes were detected by the use of the

[1] One sample was received with those from the Loyalty Islanders about which some doubt had arisen in New Caledonia. On subsequent testing it proved to be A_2, MN, Rh^o. Owing to the original doubt and to the unique grouping in respect of the A and Rh systems, a more complete genealogical examination was made. It was found that the native was a Loyalty Islander from Mare, who, in spite of his very black skin, had some European features. His maternal grandfather was said to be an Englishman. This sample was therefore excluded from the series.

TABLE II
Blood Group and M, N Frequencies.

Population.	Number of Subjects Tested.	Blood Groups.				Gene Frequencies.			D/σ_D.	Blood Types.			Gene Frequencies.		D/σ_D.
		O.	A_1.	B.	A_1B.	p.	q.	r		M.	MN.	N.	m.	n.	
New Caledonians, north ..	198	102 (51·6%)	67 (33·8%)	22 (11·1%)	7 (3·5%)	0·206	0·074	0·718	0·3	18 (9·1%)	72 (36·4%)	108 (54·5%)	0·273	0·727	1·1
New Caledonians, centre	110	72 (65·5%)	27 (24·5%)	9 (8·2%)	2 (1·8%)	0·140	0·049	0·809	0·3	4 (3·6%)	44 (40·0%)	62 (56·4%)	0·236	0·764	1·2
New Caledonians, south	92	43 (47·0%)	29 (32·0%)	12 (13·0%)	8 (9·0%)	0·201	0·090	0·684	2·0	6 (7·0%)	42 (46·0%)	44 (48·0%)	0·293	0·707	1·0
Pine Islanders	48	26 (54·0%)	19 (40·0%)	3 (6·0%)	0 (0·0%)	0·232	0·041	0·736	0·8	6 (12·0%)	20 (42·0%)	22 (46·0%)	0·333	0·667	0·4
South and Pine Islanders combined	140	69 (49·3%)	48 (34·3%)	15 (10·7%)	8 (5·7%)	0·212	0·073	0·702	1·5	12 (8·6%)	62 (44·3%)	66 (47·1%)	0·307	0·693	0·5
Loyalty Islanders ..	110	55 (50·0%)	48 (43·6%)	4 (3·6%)	3 (2·7%)	0·261	0·025	0·707	1·1	17 (15·5%)	51 (46·4%)	42 (38·2%)	0·386	0·614	0·2
Totals	558	298 (53·4%)	190 (34·1%)	50 (9·0%)	20 (3·6%)	0·204	0·059	0·731	1·6	51 (9·1%)	229 (41·0%)	278 (49·8%)	0·297	0·703	0·4

three Rh type sera, but two of these classes were further subdivided according to the reactions obtained with anti-Hr' (anti-c). No Rh-negative sample was encountered; this finding agrees with those observed in practically all coloured peoples so far examined. The only notable exception in this regard is the American Negro; but recent work on African Negroes suggests that the Rh-negative element in the former may have arisen from white admixture.

TABLE IIIA.

The Rh Types (Determined with Anti-Rh° (D), Anti-Rh' (C) and Anti-Rh" (E) Sera).

Population.	Number of Subjects Tested.	$Rh^{o'}$ (Rh_1). + + −	$Rh^{o''}$ (Rh_2). + − +	$Rh^{o'}Rh^{o''}$ (Rh_1Rh_2).[1] + + +	$Rh^{o'}Rh^{z}$ (Rh_1Rh^z). + + +
New Caledonians (north).	198	158 (79·8%)	4 (2·0%)	36 (18·2%)	0
New Caledonians (centre).	110	89 (80·9%)	1 (0·9%)	20 (18·2%)	0
New Caledonians (south).	92	73 (79·0%)	2 (2·0%)	15 (16·0%)	2 (2·0%)
Pine Islanders	48	36 (75·0%)	3 (6·0%)	8 (17·0%)	1 (2·0%)
South and Pine Islanders.	140	109 (77·9%)	5 (3·6%)	23 (16·4%)	3 (2·1%)
Loyalty Islanders	110	84 (76·4%)	3 (2·7%)	22 (20·0%)	1 (0·9%)
Totals ..	558	440 (78·9%)	13 (2·3%)	101 (18·1%)	4 (0·7%)

[1] All the 105 samples giving the reaction "+ + +" were tested with anti-Hr' (anti-c) serum.

TABLE IIIB.

325 Random Samples Tested with Anti-Rh°, Rh', Rh" and Hr' Sera.

Population.	Number of Subjects Tested.	$Rh^{o'}$.		$Rh^{o''}$	$Rh^{o'}Rh^{o''}$.	
		Anti-Hr'. −	Anti-Hr'. +		Anti-Hr.' +	Anti-Hr'. −
New Caledonians (north).	147	93 (63·3%)	19 (12·9%)	4 (2·7%)	31 (21·1%)	0
New Caledonians (centre).	62	44 (71·0%)	4 (6·0%)	1 (2·0%)	13 (21·0%)	0
New Caledonians (south).	27	19 (70·0%)	1 (4·0%)	0	7 (26·0%)	0
Pine Islanders ..	48	32 (67·0%)	4 (8·0%)	3 (6·0%)	8 (17·0%)	1 (2·0%)
South and Pine Islanders.	75	51 (68·0%)	5 (7·0%)	3 (4·0%)	15 (20·0%)	1 (1·0%)
Loyalty Islanders	41	28 (68·0%)	4 (10·0%)	0	8 (20·0%)	1 (2·0)%
Totals ..	325	216 (66·5%)	32 (9·8%)	8 (2·5%)	67 (20·6%)	2 (0·6%)

To account for the observed phenotypes one must assume the presence of the three genes $R^{o'}$, $R^{o''}$, R^z, and a fourth, which must be either R^o or r. The unequivocal finding amongst Australian aborigines of three individuals possessing the gene R^o and a complete lack of evidence of the presence of the r gene in Australians, Papuans, Admiralty Islanders, Fijians, Filipinos and Indonesians has led us to favour the gene R^o in preference to gene r. The gene frequencies calculated according to a modification of the method of Fisher (1946) are as follows: $R^{o'} = 0{\cdot}8332$, $R^{o''} = 0{\cdot}1077$, $R^z = 0{\cdot}0043$, and $R^o = 0{\cdot}0548$. (See Appendix by E. J. Williams.)

The figure given for the gene R^o may be correctly taken to represent the sum of the frequencies of genes R^o and r, whatever the assumption made.

In Table IV are shown the frequencies of p, q, r and m for various races of the Western Pacific which may reasonably be considered to be related to some component present in the New Caledonian. At the end of the table the results of this investigation, regrouped largely according to the language spoken, have been presented for comparison in the light of the previously mentioned theories.

Unfortunately little is known of the blood group frequencies of Negritoid populations, and the published information suggests that the Negritos of Africa and the Philippine Islands are not closely related. No data whatever are available for the other two of Birdsell's basic components, the Murrayian and the Carpentarian.

It would seem better, and certainly easier, to analyse our results in terms of the influence of neighbouring complexes whose blood group frequencies have been previously determined, and to leave the elemental analysis for later consideration.

Blood group frequencies in racial complexes are resultant effects which do not in themselves inform us of the chronological order of the arrival of the components. Occasionally other evidence is available which enables some inference in this regard to be drawn from blood grouping data; but usually we have no means of determining from such results whether the components migrated separately or in already mixed groups.

Thus, by reference to "Australian influence", it is intended to convey that at one stage there existed in New Caledonia a group composed of elements similar to those which produced the Australian aborigines. It is not advanced that this group migrated from Australia or that contemporary migration from the same stock resulted in the presence of similar peoples in both countries. There are indeed reasons for believing that the Australomorphic New Caledonian reached his present habitat much later than did his prototype reach Australia—perhaps even after the Polynesians reached the island, in which case it must be assumed that the blending of components took place outside New Caledonia (probably in New Guinea). By contrast, indications are that the component elements arrived separately in Australia. If this is borne in mind, no misconceptions are likely to follow references to "Australian influence", "Melanesian influence" *et cetera*. Also, it will not materially affect the argument which of the components is considered to be basic and which superimposed. However, sufficient general evidence is often available to enable a fundamental assumption in this regard to be made with reasonable confidence.

Let us assume a Negrito-Murrayian-Carpentarian complex with blood-group frequencies similar to those found in the Australian as basic for New Caledonia. Our results would indicate that this complex has been modified by other influences—least in the north-west and north centre and most in the extreme north, the extreme south and the Loyalties. In the extreme north an increase in the B factor with no appreciable increase in the frequency of M suggests, as expected, later Melanesian influence. In the Loyalty Islands an increase in M unaccompanied by an increase in the B factor is consistent with Polynesian admixture. The figures indicate that the frequency of the B factor must be very low indeed in the islands of Ouvea and Lifou; this, though confirmation of a strong Polynesian element, is not in agreement with the suggestion that later Melanesian migrations have entered the Loyalty Islands from the north-west. That the Polynesian influence has extended further is indicated by similar alterations to the frequencies in Pine Island, south New Caledonia, and a section along the north-east coast. One might also suggest a separate influence raising the frequency of the B factor in south-east New Caledonia and in Mare, the southernmost island of the Loyalties. This could be white, yellow or both, and is very recent. All these deductions are supported by other evidence. The average gene frequencies in New Caledonia are remarkably like those of the Fijian, the main difference being the higher frequency of group B in the latter. Possibly the

TABLE IV.

Gene Frequencies in Various Coloured Races.

Population.	Authors and Source.	Number Tested.	Gene Frequencies.			
			p	*q*	*r*	*m*
Papuans	Graydon and Simmons (1945).	200	0·186	0·129	0·674	0·190
Papuans	Simmons *et alii* (1946).	255	0·201	0·178	0·639	0·088
Australian aborigines	Birdsell and Boyd (1940).	805	0·260	0·014	0·729	
Australian aborigines	Birdsell and Boyd (1940).	730				0·178
Australian aborigines	Wilson *et alii* (1944).	649	0·251	—	0·749	0·297
Australian aborigines	Simmons *et alii* (1944).	70	0·313	—	0·687	0·300
Fijians	Simmons *et alii* (1945).	200	0·225	0·120	0·660	0·332
Fijians	Simmons and Graydon (1947).	110	0·186	0·096	0·726	0·314
Admiralty Islanders	Simmons and Graydon (1947).	112	0·146	0·136	0·720	0·339
Samoans	Stephenson (*after* Boyd, 1939).	500	0·103	0·118	0·766	
Maoris	Graydon and Simmons (1946).	267	0·352	0·004	0·642	0·489
Hawaiians	Nigg (1930).	413	0·382	0·018	0·604	
Filipinos	Simmons and Graydon (1945).	382	0·152	0·181	0·671	0·510
Indonesians	Simmons *et alii* (1945).	296	0·146	0·138	0·719	0·532
Japanese	Graydon and Simmons (1945).	400	0·274	0·175	0·555	0·540
Chinese	Yang *et alii* (*after* Boyd, 1939).	2127	0·220	0·201	0·587	
Chinese	Ride (*after* Boyd, 1939).	1029				0·576
Asiatic Indians (Hindus)	Greval *et alii* (1939).	300				0·760
Asiatic Indians (Moslems)	Wiener *et alii* (1945).	156	0·185	0·261	0·583	0·622
Ainu	Kubo (*after* Boyd, 1939).	504	0·296	0·111	0·606	0·423
New Caledonians	This Survey. Total.	558	0·204	0·059	0·731	0·297
New Caledonians	This Survey. Extreme north-west.	20	0·17	0·14	0·67	0·23
New Caledonians	This Survey. North-west.	33	0·26	0·04	0·67	0·26
New Caledonians	This Survey. North-east.	60	0·23	0·05	0·73	0·38
New Caledonians	This Survey. Pati.	84	0·17	0·08	0·74	0·21
New Caledonians	This Survey. Ajie and Boewe (centre).	110	0·139	0·049	0·809	0·236
New Caledonians	This Survey. Anesu.	53	0·18	0·10	0·69	0·25
New Caledonians	This Survey. Kapone (south).	79	0·25	0·05	0·69	0·35
Loyalty Islanders	This Survey. Ouvea.	11	0·26	—	0·74	0·5
Loyalty Islanders	This Survey. Dehu.	75	0·28	0·01	0·70	0·38
Loyalty Islanders	This Survey. Mare.	22	0·11	0·08	0·80	0·32

same components in different proportions are present in each group, the Negrito and Malayo-Polynesian element being more dominant in Fiji, and the Murrayian-Carpentarian and the true Polynesian elements more dominant in New Caledonia. No light is thrown by our results upon the possibility that an early Polynesian or other racial group inhabited the central or petroglyph zone of New Caledonia prior to the arrival of the present Canac or native. Because of pressure from subsequent overwhelming migrations, it would be unlikely that such an early group would be found in the area in which they originally settled. One would expect to find them pushed to the peripheral areas, which might result in a distribution indistinguishable from that produced by recent migrations of the same people in the opposite direction. Perhaps an early Polynesian group, partly blended with their successors, may have become confined largely to that north-eastern region which today shows evidence of Polynesian admixture in its blood-group frequencies.

Evidence other than that of blood-grouping indicates an underlying Negritoid population throughout the south-west Pacific Islands. This component is dominant in Melanesia, less dominant in New Caledonia and in the minority in Australia. Owing to the influence of this component we might in this series expect a blood-grouping picture intermediate between those of New Guinea and Australia. This is the case with regard to the B factor, the Rh types and perhaps also the M-N types; but without specific data for each component it is impossible to separate the Negritic influence from those of other components present in varying degree in all three groups. However, the complete absence of the B factor in the Australian suggests also that this factor was lacking or of low frequency in all his components. If this was so, we cannot ascribe the above gradation in the incidence of the B factor to gradations in any of the three components common to these territories. It seems likely that the B factor in Melanesia has been introduced by one of that group of races loosely classified as Malayo-Polynesian. This group may be further restricted by the exclusion of predominantly Polynesian races who also lack the B factor.

The Rh types found in the series are surprisingly uniform over the whole region. There appears to be no gradient evident in the figures, and the fluctuations may well be ascribed to chance. The average figures for each of the Rh types place the New Caledonian in a position intermediate between the Australian and the Melanesian, which agrees well with the evidence provided by the other blood factors. Owing to absence of data for Polynesian groups, we are unable to discuss here the effect of Polynesian admixture on the Rh-type frequencies; but a current survey on the Maoris should provide this information in the near future.

SUMMARY.

1. The blood groups, M-N types and Rh types of 558 blood samples taken from unrelated adult inhabitants of New Caledonia and the Loyalty Islands have been determined.

2. The group percentages were as follows: group O, 53·8; group A, 34·1; group B, 9·0; group AB, 3·6. All of the 210 individuals of groups A and AB were found to belong to subgroups A_1 and A_1B respectively. Gene frequencies calculated from these figures were as follows: $p = 0·204$, $q = 0·059$, $r = 0·731$.

3. The M-N type percentages were: type M, 9·1; type MN, 41·0; type N, 49·8. From these the gene frequencies, $m = 0·297$ and $n = 0·703$, were calculated.

4. Tests carried out with the three anti-Rh type sera showed that 78·9% of the samples were of phenotype $Rh^{o\prime}$, 2·3% of phenotype $Rh^{o\prime\prime}$, and 18·8% of phenotype $Rh^{o\prime}Rh^{o\prime\prime}$. Tests with anti-Hr′ serum showed that of 248 $Rh^{o\prime}$ samples, 216 were $Rh^{o\prime}Rh^{o\prime}$ and 32 were $Rh^{o\prime}Rh^{o}$, and of the 105 $Rh^{o\prime}Rh^{o\prime\prime}$ samples, four were of genotype $R^{o\prime}R^{z}$.

5. The significance of these results and of regional differences in gene frequencies within this series has been discussed in relation to the affinities of the New Caledonian with neighbouring racial groups.

6. The migrations and relative influence of the component races believed to be represented in the New Caledonian have been discussed as far as the rather inadequate data on these components permitted.

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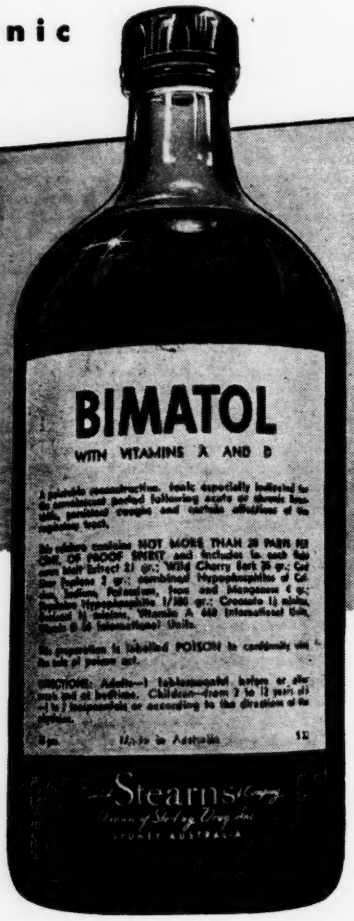

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APPENDIX.

Simplified Calculations for the Estimation of Gene Frequencies for the Rhesus Factor and an Application to Partially Classified Data.

(E. J. WILLIAMS.)

The general method of estimating gene frequencies for the Rhesus factor has been outlined by Fisher (1946),[1] and this method has been used in the interpretation of data collected for a sample of Australian aborigines. This note describes a modification of the method, which should prove useful in reducing the computational labour. The computations presented here follow closely the lines of Fisher's paper.

The method of estimation used is a direct application of the method of maximal likelihood of Fisher. As the theoretical gene frequencies are not independent (their total being of necessity unity), Fisher, in his analysis, replaces the gene frequencies by an equal number of independent variates. This obviates the need to substitute for one of the gene frequencies in terms of the others, in the equations of estimation, and preserves their symmetry of form.

If the gene frequencies are denoted by

$$P_1, P_2, P_3, \ldots P_n,$$

and the new variables by

$$x_1, x_2, x_3, \ldots x_n,$$

Fisher's transformation may be expressed explicitly as

$$P_r = \frac{e^{x_r}}{\sum e^x}$$

whence the relationships

$$\frac{\partial P_r}{\partial x_r} = P_r(1 - P_r)$$

$$\frac{\partial P_r}{\partial x_s} = -P_r P_s = \frac{\partial P_s}{\partial x_r}$$

follow.

If now, a_i is the observed, and m_i the expected frequency of the ith phenotype, the equations of maximal likelihood are

$$\sum_{i=1}^{k} \frac{a_i}{m_i} \frac{\partial m_i}{\partial x_r} = 0 \quad (r = 1, \ldots n)$$

when there are k distinguishable phenotypes. Since m is a homogeneous quadratic in the P,

$$\sum_r P_r \frac{\partial m}{\partial P_r} = 2m,$$

and consequently

$$\frac{\partial m}{\partial x_r} = P_r\left(\frac{\partial m}{\partial P_r} - \sum_s P_s \frac{\partial m}{\partial P_s}\right)$$

$$= P_r\left(\frac{\partial m}{\partial P_r} - 2m\right)$$

The maximal likelihood equations then become

$$P_r \sum_i \left(\frac{a_i}{m_i} \frac{\partial m_i}{\partial P_r} - 2a_i\right) = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

or

$$\sum_i \frac{a_i}{m_i} \frac{\partial m_i}{\partial P_r} - 2N = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

where N is the total number of specimens tested.

In order to adjust the trial values of the P, and to calculate their standard errors, we require the matrix, whose typical term is

$$\sum_i \frac{1}{m_i} \frac{\partial m_i}{\partial x_r} \frac{\partial m_i}{\partial x_s} = P_r P_s \sum_i \frac{1}{m_i} \left(\frac{\partial m_i}{\partial P_r} - 2m_i\right)\left(\frac{\partial m_i}{\partial P_s} - 2m_i\right)$$

$$= P_r P_s \left(\sum_i \frac{1}{m_i} \frac{\partial m_i}{\partial P_r} \frac{\partial m_i}{\partial P_s} - 4N\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Since P_r is a factor of all terms of the rth row and column of the matrix, and also of the rth equation (1), the omission of the P_r from both will result in multiplying the rth adjustment by a factor P_r, but will produce no other effect on the solutions.

The adjustments h are then determined by solving the set of simultaneous equations

$$\left[\sum_i \frac{1}{m_i} \frac{\partial m_i}{\partial P_r} \frac{\partial m_i}{\partial P_s} - 4N\right]\{h_r\} = \{P_r\} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

in which the trial values of P are the ones used. As the equations are not independent, one of the x may be regarded as fixed, and the remaining ones adjusted.

The adjustments g to the P values are determined according to the formula

$$g_r = h_r - P_r \sum h_r,$$

and the remainder of the calculations, including the calculations of standard errors, follows the lines of Fisher's paper.

Comparison of the method set out below with that of Fisher's paper will show that a few steps of computation are avoided, and that the calculation of the matrices (Tables IV and V in (1)) is much simplified. Thus it is hoped that these modifications will prove of practical value.

Application.

The data presented below are the result of tests on a sample of 558 New Caledonian aborigines. Four sera, anti-R^o, anti-R', anti-R'' and anti-H', were used; but as the supply of the last was rather limited, its reaction was

tested with only a subsample of 325 specimens, and subsequently with all the remaining specimens which gave a positive reaction with the first three sera. This resulted in some of the specimens being classified more completely than others.

The numbers tested, and their reactions, are tabulated below.

TABLE I.

R°	R′	R″	H′	Three Sera.	Four Sera.	Theoretical Frequency.
+	+	−	−	192	216	$(R^{o\prime})^2 = m_1$
+	+	−	+		32	$2R^{o\prime}R^{o} = m_2$
+	−	+	+	5	8	$(R^{o\prime\prime})^2 + 2R^{o\prime\prime}R^{o} = m_3$
+	+	+	+	34	67	$2(R^{o\prime}R^{o\prime\prime} + R^{o\prime}R^{z} + R^{o}R^{z}) = m_4$
+	+	+	−	2 36	2	$2R^{o\prime\prime}R^{z} + (R^{z})^2 = m_5$
+	−	−	+	0	0	$(R^{o})^2 = m_6$
				233	325	1

The class frequencies for the two subsamples show good agreement, the value of χ^2 measuring the discrepancy between them being

$$\frac{558^2}{233 \times 325}\left(\frac{192^2}{440} + \frac{5^2}{13} + \frac{36^2}{105} - \frac{233^2}{558}\right) = 3{\cdot}11$$

with two degrees of freedom, not significant.

In setting out the theoretical frequencies, it is assumed that only the genes $R^{o\prime}$, $R^{o\prime\prime}$, R^{z} and R^{o} exist; and indicating the frequencies by the same symbols as for the genes themselves, we therefore have

$$R^{o\prime} + R^{o\prime\prime} + R^{z} + R^{o} = 1$$

The reactions observed could be accounted for equally well by assuming the gene r instead of R^{o}, and the estimate found for R^{o} will in fact represent the frequency $(R^{o} + r)$. While this fact should be noted, it does not affect the computations in any way.

Solution of the Maximal Likelihood Equations.

The likelihood of the observed samples is

$$\text{const.} \times m_1^{216} m_2^{32} (m_1 + m_2)^{192} m_3^{13} m_4^{101} m_5^{4},$$

which is to be maximized for variations in the R, to give the maximal likelihood estimates of the R. It is seen that the inclusion of the data from the specimens only partially classified in no way complicates the expressions involved, and that the information provided by these data is naturally included when the maximal likelihood equations are solved.

Differentiating the likelihood by the variables x_1, x_2, x_3 and x_4 as defined above, in turn, we find the equations, of the form of equation (2), to be

$$\frac{216}{m_1}\frac{\partial m_1}{\partial R} + \frac{32}{m_2}\frac{\partial m_2}{\partial R} + \frac{192}{m_1 + m_2}\frac{\partial (m_1 + m_2)}{\partial R} + \frac{13}{m_3}\frac{\partial m_3}{\partial R} + \frac{101}{m_4}\frac{\partial m_4}{\partial R} + \frac{4}{m_5}\frac{\partial m_5}{\partial R} - 1116 = 0$$

The provisional gene frequencies are set out in Table II.

TABLE II.

$R^{o\prime}$	0·8332
$R^{o\prime\prime}$	0·1077
R^{z}	0·0043
R^{o}	0·0548

The expressions given by the left hand side of equation (2) are set out in Table III, and the matrix of sums of squares and products in Table IV.

As a check, the sum of products, with the corresponding provisional gene frequency, of the values in each column of Tables III and IV, totals to 2·0 and to zero respectively.

TABLE IV.

195·199	−1118·908	−897·155	−698·457
−1118·908	8942·065	−552·543	−518·438
−897·155	−552·543	216013·766	−2223·377
−698·457	−518·438	−2223·377	11812·972

The third row and column of Table IV, corresponding to R^{z}, being omitted, the inverse matrix is found as in Table V.

TABLE V.

——	—	——	Row Total.
0·1741801	0·0224491	0·0112838	0·2079130
0·0224491	0·0030055	0·0014592	0·0269138
0·0112838	0·0014592	0·0008159	0·0135589

The values of the adjustments h, and the adjustments g to the R, are given in Table VI.

TABLE VI.

——	h	$g = H - R\Sigma h$	Adjusted Frequency.	Standard Error.
$R_{o'}$ ..	0·00174,6	0·00004,5	0·83325	0·01220
$R_{o''}$ ..	0·00021,0	−0·00001,0	0·10769	0·00945
R^{z} ..	—	−0·00000,9	0·00429	0·00214
R^{o} ..	0·00008,6	−0·00002,6	0·05477	0·00871
	0·00204,2	0·00000,0		

The covariance matrix (Table VII) for the R estimates is found by operating on the rows and columns of Table V in the same way as the second column of Table VI is obtained from the first.

TABLE VII.

Covariance Matrix Multiplied by 10^7.

1488	−787	−41	−660
−787	894	−7	−100
−41	−7	46	2
−660	−100	2	758

Table VIII, giving the comparison of observed frequencies with those expected, shows that the data are in good agreement with theory.

TABLE VIII.

Frequencies of Different Phenotypes.

	Calculated.	Observed.
$325m_1$	225·65	216
$325m_2$	29·67	32
$233(m_1 + m_2)$ ..	183·04	192
$558m_3$	13·05	13
$558m_4$	100·92	101
$558m_5$	4·00	4
$558m_6$	1·67 → 5·67	0 → 4
	558·00	558

$$\chi^2 = \frac{216^2}{225{\cdot}65} + \frac{32^2}{29{\cdot}67} + \ldots + \frac{4^2}{5{\cdot}67} - 558$$
$$= 1{\cdot}53$$

with two degrees of freedom, not significant.

Reference.

(1) R. A. Fisher: "The Fitting of Gene Frequencies to Data on Rhesus Reactions", *The Annals of Eugenics*, Volume XIII, 1946, page 150.

TABLE III.

Observed Frequency.	216	32	192	13	101	4	0	Discrepancy.
$R^{o\prime}$	2·400384	1·200192	2·260862	0	1·190919	1·197103	0	0·0458
$R^{o\prime\prime}$	0	0	0	13·886984	9·260858	0	0	−0·1226
R^{z}	0	0	0	0	1·796883	233·156691	0	−1·8881
R^{o}	0	18·248175	2·121341	9·203866	0·047548	0	36·496350	−0·3083

ANÆSTHESIA IN GENERAL PRACTICE: PRE-OPERATIVE CONSIDERATIONS.[1]

By RONALD V. PRATT,
Perth, Western Australia.

IN tonight's symposium on "Anæsthesia in General Practice" my remarks will be confined to the pre-operative phase of the subject. So many important principles and practices are involved under this heading that to cover them adequately would require much more than a single evening's discussion; and in my own limited time I propose merely to run very briefly over those aspects of everyday practical importance. Anæsthetic agents and methods which fall within the scope of the specialist anæsthetist, but outside that of the general practitioner, will not be considered.

Before undertaking the pre-anæsthetic management of any individual patient one should be clearly aware of a few basic facts. Firstly, one should know what is the goal of anæsthesia. Then, too, one must realize that modern anæsthesia has progressed a long way in a short time; today, thanks to an ever-increasing array of agents and methods, many more surgical procedures are possible and many more "bad-risk" patients are operable, than hitherto. To avail himself of many of these very material advantages it becomes necessary for the general practitioner to familiarize himself with quite a range of anæsthetic agents and methods.

Available Anæsthetic Agents.

What is there available for the general practitioner's purposes other than ether and ethyl chloride? Let us run briefly through his choice of agents, their advantages and disadvantages, methods of use and general scope. I would list them under four headings: inhalational, intravenous, spinal and local.

Ethyl Chloride.

Ethyl chloride needs little introduction. It is convenient, portable and usually employed on the open mask. its potency and its potential toxicity, however, should never be forgotten. It is a powerful myocardial depressant, and the very rapidity of action for which it is so often used constitutes perhaps its principal danger. It is a safe choice only if one adheres rigidly and invariably to the rules generally laid down for its administration, and if one reserves it only for anæsthesia of less than two minutes or for the short induction prior to an ether anæsthetic. Thiopentone has supplanted it for obvious reasons in many situations. However, the much shorter recovery period of ethyl chloride will still favour its use in many short procedures carried out in the practitioner's surgery or the out-patient department. And the difficulties of intravenous injection in young children will also favour the continued use of ethyl chloride by and large in children's surgery.

The chief contraindications to ethyl chloride are the "poor-risk" patient and the use of the cautery. A potent myocardial toxin of this nature must obviously be used most cautiously, if at all, on any seriously ill or debilitated patient—not merely the frank "cardiac", but all those in whom cardiac vulnerability must be inferred, such as the diabetic, the senile, the anæmic and so on.

Ether.

Passing on to ether, it seems hardly likely that ether, dropped on the draped mask, will go out of fashion as the favoured agent for most surgical operations in general practice. While it suffers from certain important disadvantages, such as its irritating properties, its tendency to cause frequent and often severe post-operative vomiting, its lengthy recovery time and its inflammability, nevertheless, its administration is blessed by several valuable features which contribute to its reputation as the standard anæsthetic for general practice. In hands which have received good basic training in its administration, the use of ether usually makes it comparatively easy to satisfy the surgeon's requirements and that with a very wide margin of safety so far as the majority of patients are concerned. It is also inexpensive and requires a minimum of equipment. The most important point to keep in mind, however, is that the choice of ether will nearly always ensure a safer, more adequate, supply of oxygen for the patient than would be permitted by the use of other and more modern methods (such as the intravenous injection of barbiturates or moderately high spinal anæsthesia). In short, a well-given ether anæsthetic at the present day is always preferable to one indifferently given by any other method.

The principal contraindications to the use of ether are: (i) the use of the cautery and other circumstances involving a fire or explosion hazard; (ii) respiratory infections such as sinusitis, bronchitis, pneumonia, active pulmonary tuberculosis and so on; (iii) moderate or marked degrees of respiratory obstruction; and (iv) some "poor-risk" patients. For "poor-risk" patients in general ether cannot be regarded as the ideal anæsthetic. In these cases I think it is more often than not advisable to refer the anæsthetic problem to the experienced anæsthetist. This may be impossible in some country districts, and here I would urge the adoption of "open ether" anæsthesia with a continuous supply of oxygen into the airway. Local or regional block is perhaps the most satisfactory alternative. At all events, do not select thiopentone or spinal anæsthesia for the really "poor-risk" patient unless you "know all the answers" in anæsthesia.

Having chosen ether for your patient, you must still consider long before the operation what is going to be the best method of administration and whether the provision of any equipment beyond a bottle of ether is likely to reduce the risk for the patient. There are other methods than the traditional "rag and bottle" available to all general practitioners, and while the necessary equipment involves a small capital outlay, the advantages do seem to many of us to make such methods worth while. I refer to the use of ether vaporizers of various types. Of these, the most popular one today is the simple "draw-over" type. With the aid of an air-tight face mask and a short length of wide-bored corrugated hosing, the patient simply inhales atmospheric air, drawing it first over the surface of ether lying in some suitable container, such as a bottle or metal tank; his exhalations, however, pass directly into the surrounding atmosphere through a very simple valve placed close to the mask. Beyond a few details of construction there is nothing more to the method than that in the simplest types of ether inhaler. Significant advantages of this method include the provision of an evenly maintained supply of ether vapour, the ability to regulate the concentration of the vapour instantly from the merest trace to the maximum concentration ever likely to be required, the elimination of the chilling effect of the open method on the respiratory passages, and (incidentally) the fact that the method is less laborious and much less wasteful of ether. The Oxford vaporizer is an expensive and elaborate machine of this type, but cheap and simple vaporizers can be bought or constructed which are just as useful for most purposes. The Marrett's apparatus designed for trichlorethylene is quite serviceable when used as a "draw-over" ether vaporizer; it may need to be warmed occasionally by being stood in water.

Chloroform.

I have little to say regarding chloroform as a choice for anæsthesia. Its principal advantage over ether and other volatile agents is its non-inflammability. As we have safer agents available which are equally non-inflammable, I think that any possible advantage of chloroform is far outweighed by its well-established disadvantages and dangers. If it is desired to employ chloroform for any special reason, I would suggest the employment instead of trichlorethylene, similar in most respects to chloroform, but a good deal safer for general purposes.

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on July 21, 1948.

Trichlorethylene.

Trichlorethylene is a rather poorly volatilizing agent marketed as a blue fluid under the trade name of "Trilene". A complete assessment of its position is not yet possible. While its scope is somewhat limited, we feel in this State that for certain purposes it has a definite use.

The advantages of trichlorethylene are that it is readily portable, is agreeable to patients, does not commonly produce much post-operative vomiting, is not irritating to the lungs, is non-inflammable, is quite inexpensive and is fairly easy to administer. Two additional advantages are also worth mentioning, namely, the observation sometimes made that capillary bleeding from surgical wounds appears to be less than occurs with ether, and also the observation that the pharyngeal and laryngeal reflexes are lost at a comparatively light plane of anæsthesia (this being of some importance in cases in which intubation is required, in tonsil operations and so on).

Trichlorethylene is not of much use by itself when full surgical relaxation is required, as in most abdominal operations. However, this disadvantage can be overcome by combining its administration with that of ether at the appropriate stages of the operation. In this way one needs considerably less ether than if ether alone is being given, and thus the advantages of trichlorethylene are for the most part retained. It should be avoided for "poor-risk" patients and particularly for those with cardiac disease.

Briefly, the scope of trichlorethylene may be said to lie mainly in its use for operations on "good-risk" patients who do not require complete muscular relaxation, and it is especially useful when the cautery or endotherm is to be used or when a non-irritating anæsthetic is required, or where an endotracheal tube is to be passed. It is also of service as an analgesic agent during the first and part of the second stages of labour; for this purpose, Freedman has described a safe and simple apparatus for self-administration, which is now available from several of our local supply houses. As an analgesic agent I have found trichlorethylene most useful at times in general practice for such procedures as painful dressings, sutures and even certain incisions; with cooperative patients the results have been most satisfying.

When trichlorethylene is used as an anæsthetic a vaporizer is required, as the liquid is not sufficiently volatile for the open-mask technique. Marrett's vaporizer as supplied by Commonwealth Industrial Gases, Limited, is very suitable, or the Oxford vaporizer can be used for the purpose.

Di-Vinyl Ether.

Di-vinyl ether, marketed in this country by May and Baker, Limited, in three and five millilitre ampoules under the trade name "Vinesthene", is at the other end of the scale of volatility, evaporating rapidly once its container is opened. It bears a superficial resemblance to ethyl chloride in some respects: (i) in being a highly volatile, inflammable, non-irritating liquid of pleasant odour which can be carried about in compact ampoule form; (ii) in its rapidity of action, producing third stage anæsthesia in a few breaths; and (iii) in its very rapid recovery period. Unlike ethyl chloride, its administration can be prolonged if necessary up to three-quarters of an hour, and the recovery stage shows practically no after-effects of nausea, vomiting or physical incapacity. So far as price is concerned, I have found it to be actually cheaper than ethyl chloride when used in a similar manner, a five-millilitre ampoule costing one shilling.

For general practice I think that the scope of vinyl ether lies mainly in its use as a substitute for ethyl chloride, its advantages over the latter residing in its greater safety, its pleasantness and especially in the rapidity and completeness with which patients recover; they are able to walk away in a matter of a few minutes. Longer administrations require special apparatus, although of a type which I think could be employed in general practice without much difficulty.

Vinyl ether appears to be used extensively in America by the open mask and drop bottle method, but this is not yet possible in this country owing to the comparative scarcity and cost of vinyl ether. For practical administration here a closed inhaler is necessary, and various types (such as Goldman's or one of its modifications) can be purchased. My own practice is to attach a small rubber bag to a sidearm vent on a simple ether or trichlorethylene vaporizer, to fill the bag with oxygen, and then to tip in the contents of a three or five millilitre ampoule of "Vinesthene". The patient rebreathes this mixture until the desired plane of anæsthesia is reached. This serves either as a "single-dose" anæsthetic for short procedures or as induction for ether or trichlorethylene by simply shutting off the bag and allowing the vaporizer to carry on with its usual function. By carrying a small cylinder of oxygen along I have given vinyl ether in this way both in general practitioners' surgeries and in patients' homes with no more inconvenience than with ethyl chloride and with the added advantages already mentioned, principally that the patient recovers with no after-effects or incapacity.

Barbiturates for Intravenous Injection—Thiopentone.

The next group to consider in making one's choice of an anæsthetic agent is that of the barbiturates which are given intravenously. Of these, the sulphur-containing soluble thiopentone has become the most popular and is marketed under the names of "Pentothal Sodium" and "Intraval Sodium". As the use of this group has recently become very widespread, and as we are to see a film tonight devoted to the subject, I shall confine my remarks to one or two matters directly concerning its choice for particular cases. Briefly and rather dogmatically I would say that thiopentone is a superlatively good hypnotic but a very poor anæsthetic. Do not choose it as the sole agent for any operation lasting (or which may conceivably last) more than fifteen minutes; if you do, varying degrees of barbiturate intoxication will result, and this will often be more particularly evident in the robust young adult who requires large amounts of the drug to keep him quiet. As an induction prior to the administration of inhalational anæsthetics, use fairly small amounts. I suggest that from three to five millilitres of the 5% solution will be sufficient, depending on the patient's general condition and weight as well as on his reaction to the slow administration of the solution, scarcely more being given than is required to abolish his responses to questioning.

The two principal risks in the giving of thiopentone are respiratory depression (which always occurs) and laryngeal spasm (which occasionally occurs). Therefore do not choose thiopentone for your patient who requires maximum oxygenation; the patient I refer to is the one with any type of respiratory embarrassment, with severe anæmia, with a defective myocardium, or with marked, senility, debility or shock. Furthermore, to reduce the risks of laryngospasm, never administer thiopentone without preliminary atropine or hyoscine (and having administered it, do not stimulate the pharynx by pushing in unnecessary or unsuitable airways).

Spinal Anæsthesia.

Spinal anæsthesia is frequently an excellent choice in general practice, provided that one confines its use to "good-risk" patients with lesions below the umbilicus and provided that one learns and exercises a meticulously correct technique in all particulars.

In so far as the principal hazards are depressed blood pressure, depressed respiration and meningitis, it is obviously good practice to avoid this method whenever one suspects a defective myocardium, shock, anæmia, respiratory embarrassment, infections of the back or the blood-stream, or any disease of the central nervous system.

In general practice I think the method should not be used for anæsthesia above the umbilicus. On the other hand, low spinal anæsthesia is most satisfactory for perineal surgery, such as hæmorrhoidectomy, and the hazard is almost negligible.

In the choosing of a satisfactory solution it is generally better to stick to one or two familiar ones. I have used

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Further information on request

*J. Pharm. & Pharmacol., January, 1949, p.60
†Science, 16th April, 1948, p. 397.

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Local and Regional Analgesia.

Local and regional methods of producing analgesia do not figure very largely in the work of the Australian anæsthetist, but that is not to say that their use in general practice is not of great value. Their everyday employment as surface agents for the eye and the nose, and as infiltration agents for removal of sebaceous cysts and the like, and for carrying out clean minor procedures on fingers and toes, does not merit mention here. Their use in other operations, such as suprapubic cystotomy, the surgery of congenital pyloric stenosis, the relief of some types of intestinal obstruction *et cetera*, is not so commonly practised, but deserves more consideration in one's choice of anæsthetic method.

It may help one to decide whether or not to employ local analgesia if one balances the advantages against the disadvantages in any particular case. The more important advantages include, firstly, the fact that one will be using perhaps the safest form of anæsthesia for the "poor-risk" patient, that one may undertake surgery single-handed, as is so often necessary in the country, and that the method is available in an emergency for patients who may be totally unprepared for general anæsthesia (having recently eaten, for instance). It may be impossible to enjoy these advantages, however, if some contraindication exists; for example, children or very apprehensive adults may make general anæsthesia obligatory; lack of opportunity to acquire proficiency in the technique, or lack of time pre-operatively to carry out careful infiltrations may determine its discard in one's choice; and infection in the vicinity of the surgical area is a strict contraindication to local infiltration methods.

Choice of Anæsthetic in Certain Cases.

Children.

The anæsthetic of choice for young children in general practice is a simple one—it is usually ethyl chloride and ether or nothing. The endotracheal route should always be used when indicated, although for tonsillectomy the insufflation of ether vapour into the pharyngeal tube of the Davis gag is generally regarded as quite safe and satisfactory.

As alternatives to ethyl chloride and ether I have found both trichlorethylene and vinyl ether to be pleasant and effective when employed within their respective limitations for children. I think that further consideration of their possibilities by general practitioners would be well justified.

The Aged.

The aged require extremely cautious handling at all stages. Though their oxygen requirements are low owing to lowered metabolism, yet their tissues are frequently starved of oxygen through degenerative and other changes; and so oxygenation becomes their predominant need.

The senile condition calls for extremely light preliminary sedation, for the choice of ether with a flow of oxygen, or else for local analgesia, and for strict avoidance of anæsthetic overdosage. If their anæsthetic risk is doubtful, call for specialist assistance. And beware of intravenous or spinal anæsthesia.

Respiratory Disease.

With patients suffering from active respiratory disease two factors are of importance. Firstly, avoid the irritating effect of ether and, secondly, avoid at all costs causing shallow, depressed breathing which by hypostasis may initiate post-operative pneumonia of various types. Ether given with a vaporizer is less harmful, but for preference give trichlorethylene, low spinal anæsthesia, or local analgesia with or without light thiopentone anæsthesia. Higher spinal and heavy thiopentone anæsthesia will all too often create dangerous pulmonary hypostasis. Full atropinization is essential, and especially so for heavy smokers.

Cardio-Vascular Disease.

Whenever cardio-vascular conditions are suspected, obtain a hæmoglobin estimation and, if possible, an electrocardiogram. Arrange for blood to be given when severe anæmia is present or when much blood loss is expected. Choose ether or local anæsthesia and ensure a good supply of oxygen in the theatre. Spinal and intravenous anæsthesia is better avoided in most cases, although in small amount thiopentone may be used for induction, eliminating any struggling, which may be so harmful for cardiac patients.

Diabetes.

In diabetes ether is not the anæsthetic of choice. Local or spinal methods would be preferred in general practice, although for a well-stabilized diabetic ether might conceivably be employed if one took care to avoid the deeper planes and prolonged administration.

For a stabilized diabetic do not forget to order 20 units of insulin to be given four hours before operation, along with 60 grammes of glucose either as powder or in as little water as possible; if you allow it to be given in a large quantity of water you may find it vomited at the time of the induction; this has happened more than once before. In an emergency with an unstabilized diabetic an intravenous glucose-saline drip infusion should be set up, 20 to 100 units of insulin given, and an experienced anæsthetist consulted.

Abdominal Operations, Herniæ et Cetera.

The administration of ether by the open mask or preferably by the vaporizer method, is undoubtedly the standard method of choice for intraabdominal procedures, in both the upper and the lower parts of the abdomen. Trichlorethylene is also useful provided that ether is given at such times as relaxation is required. Inguinal hernia patients do quite well under spinal anæsthesia, which obviates the post-operative coughing and vomiting liable to be produced by ether.

The Use of Cautery and Endotherm.

The choice where the electric knife or cautery is to be used is limited to trichlorethylene, thiopentone, and spinal and local anæsthetics. Which of these will be used will depend obviously on the surgeon's requirements and the ability of the anæsthetist, as well as on the patient's condition. For example, radical mastectomy is as a rule quite adequately performed under trichlorethylene, prostates may be resected under spinal analgesia, and light cauterization of the skin or of the cervix is often managed conveniently with thiopentone.

The Pre-Operative Management of the Patient.

Plan of Action.

When one is requested by a colleague to give an anæsthetic, certain preliminary steps must be taken before the actual anæsthetic is given.

1. One should obtain from the surgeon as much information as possible concerning his patient and his surgical requirements. One must have full particulars of the patient's identity, relevant details of his condition, which may be best known to the surgeon, the nature and extent of the operation, and any important details of procedure, such as use of the endotherm, unusual posturing *et cetera*.

2. One should take the earliest opportunity to see the patient. Whenever possible, of course, the patient should be admitted at least twenty-four hours prior to operation and the anæsthetist should see him not later than the evening before operation. Unfortunately the patient is all too commonly seen first in the operating theatre. I think this is rather regrettable and I do know that when I have myself been guilty of such procedure (usually through the patient's late arrival in hospital), something not infrequently goes wrong. Perhaps the premedication ordered

over the telephone has been inadequate or excessive, or the patient shows some physical impediment to the method selected or has a different surgical problem from what one imagined from the original description. Such misapprehensions are avoided if one sees the patient beforehand and plans accordingly. Also one owes it to the patient to meet him under conditions favourable to examination and favourable to allaying any apprehensions he may have regarding his operation. In making this preoperative visit one should commence, here as elsewhere, with a careful inquiry into the patient's medical antecedents; and especially is it necessary to ask him about any previous anæsthetic experiences and whether any particular difficulties were met. Questioning should be adequate to uncover any possible heart or lung trouble, as well as any other visceral disease. Careful examination, including measurement of the blood pressure, must never be neglected or skimped. It is by no means uncommon to find at this examination such unsuspected conditions as cardiac arrhythmias, early congestive failure, marked hypertension, gross dental sepsis and so on. It is the anæsthetist's responsibility to find these things, and not the surgeon's. Always give a passing glance to determine the suitability of the nostrils and jaws for possible intubation, and of the arm veins for possible thiopentone or other intravenous injections; the knowledge may stand you in good stead. If you have doubts regarding the patient's fitness, a useful test is to time him while he holds his breath (or hold yours with him for comparison); thirty or forty seconds are quite good, but even ten seconds may not necessarily be hopeless.

3. Having learnt as much as possible from the patient, and having examined the urine record and any pathological data which may be available, one has to evaluate the whole situation and decide on the most satisfactory anæsthetic and method. The method chosen will be entirely satisfactory if it provides the maximum safety and comfort for the patient combined with the maximum assistance to the surgeon in terms of access and relaxation.

4. Next, having satisfactorily planned the character of the anæsthetic to be given, one must leave full instructions with the sister in charge for the patient's preparation up to the moment he goes to the theatre. Incidentally, these instructions will be of greater value if they are written down.

5. Finally, one should not leave the patient on this visit without giving him a little much-needed psychotherapy. Find out whether he has any particular apprehension; if he has, reassure him accordingly. Explain briefly what his sensations will be before and during his induction. Above all, leave him feeling confident that everything possible will be done to ensure both his safety and his comfort.

Preliminary Medication.

Let us consider more fully the nature of the instructions to be left with the ward sister.

The patient requires to be put into the best possible condition for his operation and anæsthetic. If he is dehydrated, anæmic, shocked, toxic, diabetic, suffering from congestive cardiac failure or uræmia or hepatic deficiency or gross nutritional deficiency, or what have you, then the need for appropriate pre-operative counter-treatment is obvious and demands the earliest admission to hospital possible prior to any contemplated surgery. If operation is urgent and time does not permit of adequate therapy, do the best possible in the available time—provide fluids intravenously, blood, glucose, insulin, penicillin, rapid digitalization, vitamin *K*, amino acids and so on. It is never too late for such essential measures; if need be, carry them out during the operation itself. With regard to blood transfusions, now more freely available, it is well to remember that quite a number of patients have died after their administration; beware of giving large transfusions or rapid transfusions, especially to the elderly.

Even if his health appears unimpaired the patient still needs additional reserves of glucose and rest. Therefore see to it that he is fed on glucose fluids and barley sugar the day or night before operation and that he is given a suitable sedative to ensure complacency and a good night's sleep. Normally, three grains of "Nembutal" at 8 p.m. or two grains of phenobarbitone at 7 p.m., or combinations of these drugs, should be adequate. If barbiturate sensitivity is known to exist, bromide and chloral, or chloretone, would be quite suitable. I order "Nembutal" as a routine measure the night before, partly with the object of picking up that rare case of true barbiturate sensitivity before using thiopentone next morning.

Prior to all anæsthetics given in general practice, the patient should receive a sedative drug together with either atropine or hyoscine.

Pre-Operative Sedative.

The sedative is required firstly to remove apprehension and secondly to lower the metabolic rate, which will mean lessened oxygen requirements and less anæsthetic needed to produce the same degree of anæsthesia.

Morphine is the sedative most commonly used, although it is not necessarily always the best. It is given in doses varying from one-eighth of a grain to one-quarter of a grain, one-sixth of a grain being the most suitable average dose. Morphine suffers from two main disadvantages: it depresses respiration and some patients are sensitive to it (a recent study of over a hundred patients indicated that some 27% of the patients were sensitive to morphine). The effect on respiration is particularly marked at the extremes of age and as an arbitrary rule I would suggest that it be not used in those under fifteen or over sixty years. Three-quarters of a grain of "Seconal" or five grains of chloretone are suitable pre-operative sedatives for children, while for the aged my own preference is for pethidine (50 milligrammes). If patients are really sensitive to morphine, I do not think there is much point in giving them "Omnopon" or "Dilaudid" as a substitute; a barbiturate or pethidine is preferable. Heavy sedation is most undesirable, except before spinal or local anæsthesia. A patient whose respiration has been depressed by morphine will require a longer induction period, will be poorly oxygenated, and will show a prolonged recovery period with added risks of respiratory complications. If through inadvertence the patient comes to the table showing obvious signs of excessive morphine, give him an intravenous injection of "Coramine" before commencing the anæsthetic. Preferably, morphine should be given about an hour and a half before operation. It should never be ordered for less than three-quarters of an hour before, and the reason for this is that we wish the full depressant effect to be reached before the patient comes to the theatre; thereafter depression steadily diminishes and only the sedative effect remains.

As an alternative to morphine one of the barbiturates can often be chosen. For instance, one and a half to three grains of "Seconal" three-quarters of an hour before, or the same dose of "Nembutal" one and a half hours before, may be ordered. It is wise to include a barbiturate before spinal or local analgesia, as members of this group reduce the toxicity of those of the cocaine-procaine group.

Another pre-operative sedative of a milder type, but one well worth remembering, is chloretone. Fifteen grains given two hours before operation will be found very satisfactory, especially prior to ether.

Atropine or Hyoscine.

In association with one or other of these sedatives do not fail to order atropine or hyoscine. The need here is principally the reduction of excessive parasympathetic activity. Undue vagal activity in the form of increased secretions, tendency to laryngospasm as with thiopentone, increased peristalsis under spinal anæsthesia and sudden disturbances of the carotid sinus and cardio-aortic reflexes, which may be excited by such manipulations as dilatation of the cervix, is a mechanism providing so many potential hazards as to be guarded against at all costs. So do not omit atropine (or hyoscine), no matter what type of anæsthesia is intended. Atropine also counteracts some of the respiratory depression of morphine.

Neither atropine nor hyoscine should be given hypodermically less than three-quarters of an hour before operation. I usually order hyoscine one and a half hours

before and atropine one hour before, combining with morphine in each case where the latter is also given. If the injection has not been given in good time, then it should be injected intravenously in the theatre.

As for dosage, I think $^1/_{100}$ grain of atropine or $^1/_{150}$ grain of hyoscine is the most suitable average dose. When morphine is given, the ratio of 25 parts of morphine to one part of hyoscine (for example, one-sixth of a grain of morphine with $^1/_{150}$ grain of hyoscine) should generally be observed, as this has been found to give the best balance pharmacologically. To most children and to the elderly I would give $^1/_{150}$ grain of atropine. Hyoscine is also useful for its amnesic effect and is very suitable for most young and middle-aged adults, but not for the elderly. Atropine is suited to the great majority of patients and is very dependable in its effect; as it raises the metabolic rate; however, it should be avoided with all thyreotoxic patients. It may be given orally to children in suitable mixture form, if desired, about an hour and a half before operation.

Other Pre-Operative Details.

So much for the drugs used in pre-medication. With regard to nursing procedures, certain essentials may be taken for granted with well-trained staffs, but should always be insisted upon. Immediately prior to operation the emptiness of three viscera should be assured—stomach, bladder and rectum. However, do not purge your patient and do not order any pre-operative enema unless required by the surgeon or unless the patient is constipated; with normal bowel habits an empty rectum should obtain without recourse to such undesirable measures.

The patient must be allowed to enjoy his night's sleep as long as possible. All nursing procedures, such as skin preparations, must be completed before the sedative is given, lest its beneficial effect be wholly lost. Dentures and any other loose body in the mouth should be removed in the ward (unless you have special reasons for leaving them in), and it is advisable also to have removed any articles of jewellery worn.

The patient should be transported gently and with adequate blankets from his bed to the table, nor should he ever be permitted to walk to the theatre. Finally, while a certain time spent waiting in the induction room or the theatre is not undesirable and often inevitable, this should not be in excess of ten minutes. If proceedings are held up for longer than this, someone is at fault—do not let it be the anæsthetist.

LEPTOSPIROSIS AT INNISFAIL.

By THOMAS A. MERTON,
Innisfail, Queensland.

TWENTY CASES of clinical leptospirosis were encountered at the Innisfail Hospital from early June to late in August, 1948. June was the wettest month, and all but three cases occurred in that month.

In nine cases there was a diagnostic serological reaction to leptospira of the *australis* B type. Five of the patients came from Daradgee, three from Wangan and one from South Johnstone.

One patient from Daradgee, a brother to two of the patients with proved infections, was admitted to hospital on the first day of his illness, and prompt penicillin therapy seemed to limit his disease to three days. His story was typical. He had fever for one day after his admission to hospital. The other patients had fever for five days after their admission to hospital, but they had not reported to hospital till the end of the second or third day of their illness. It seems reasonable to assume that he had the infection too, but that penicillin affects the condition only if given on the first day of the illness. This probably needs further investigation.

The patients whose agglutination tests yielded negative results came from districts widely scattered around Innisfail; only one came from Wangan and none came from Daradgee. There were also two patients on whose agglutination tests no report has been received; both of these were severely ill and both came from Daradgee. One of these developed severe carpo-pedal spasm. The other developed slight jaundice and after his discharge from hospital was readmitted seven days later suffering from post-leptospiral iritis; he had been twenty-six days in hospital in the first instance.

The eight patients whose diagnosis was not confirmed serologically had all the constant features, with the exception that in four cases no vomiting occurred. These patients may have been infected with a mild strain of hitherto unidentified leptospira.

The constant features of the disease were as follows: (i) fever of moderate degree (102° to 103° F.), falling within five days by lysis; sometimes there was a fall on the second or third day followed by a rise which did not attain the original height; (ii) intense headache; (iii) vomiting; (iv) dry tongue; (v) malaise; (vi) depression; (vii) congested eyes; (viii) a slower pulse than is usual with fever.

The less constant signs and symptoms were as follows: (i) slight jaundice (two cases); (ii) glandular enlargement in axilla or groin (two cases); (iii) neck rigidity (one case); (iv) pain in the epigastrium (one case); (v) tendernes over the spleen (one case); (vi) tenderness over the gall-bladder (one case); (vii) leucopenia or leucocytosis—that is, no definite constant blood picture; (viii) petechial rash (one case); (ix) trace of albumin in the urine (three cases).

Treatment.

The treatment given consisted of the following: (i) 30,000 units of penicillin given every three hours in most cases; in severe cases 60,000 units were ordered to be given immediately and thereafter 30,000 units very three hours; (ii) "Campolon", five millilitres per day given intramuscularly; (iii) "Synkamine", two millilitres per day; (iv) intravenous injections of calcium gluconate, 10 millilitres per day; (v) copious glucose drinks. "Carbogen" and calcium gluconate with sedatives were given to the patient with carpo-pedal spasm. Headache and restlessness were treated with the usual analgesics and sedatives. Most patients were depressed and did not need sedatives.

Prognosis.

The prognosis always appears to be good, although, remembering the teaching of my professor of medicine that Weil's disease is one of the causes of chronic nephritis of the primary type, I have written compensation certificates for one patient who had leptospirosis in 1944 and who has since that date developed gradual impairment of health and is now in hospital with uræmia and cardiac asthma. He is suffering from chronic glomerular nephritis. I feel that he has a just claim for compensation. He had severe leptospirosis with jaundice and the diagnosis was confirmed serologically. He received compensation in 1944 for time away from work.

Apart from the patient with iritis, no other patients have developed any sequelæ sufficient to make them return to the hospital for treatment.[1]

Reports of Cases.

AN UNUSUAL CASE OF AMBLYOPIA OCCURRING AT PARTURITION.

By K. MELVILLE KELLY,
Hobart.

MRS. B., aged thirty-three years, consulted me for her first pregnancy when two months pregnant. She gave no history of previous illness; her blood pressure was 120 millimetres of mercury (systolic) and 70 millimetres

[1] The report on the two severe cases from Daradgee has since come to hand and in both instances agglutination was positive for *australis* B type. Another repeated test gave a positive result and brought the total number of serologically confirmed cases to twelve.

(diastolic) and urinary examination revealed no abnormality.

She attended each month, and nothing abnormal occurred until she was seven months pregnant, when she complained of some swelling of the fingers; no swelling of the ankles was noted, and no headaches were experienced, but the blood pressure was 145 millimetres of mercury (systolic) and 100 millimetres (diastolic), and the urine contained a trace of albumin. She quickly improved with rest and diet modification, and two weeks later the albuminuria and swelling were no longer present and the blood pressure was 128 millimetres of mercury (systolic) and 90 millimetres (diastolic).

She remained well and was examined a few days before coming into labour at the expected time. A faint trace of albumin was again noted, and the blood pressure was 135 millimetres of mercury (systolic), 90 millimetres (diastolic). On her admission to hospital in labour about 3 p.m. a cloud of albumin was noted in the urine; at 10 p.m. she complained of dimness of vision, and examination of the urine revealed "half-solid" albumin.

She was delivered of a live, healthy, male child at 8.30 on the following morning, and on awaking from the anæsthesia complained that she could not see at all. The blood pressure was now 135 millimetres of mercury (systolic) and 90 millimetres (diastolic), and the urine was "half-solid" with albumin.

Intravenous infusion of 25% dextrose solution was commenced, and after 600 millilitres had been given the urinary output was satisfactory and the albumin content decreasing, and treatment was discontinued.

Meanwhile, the eyes were examined, and it was noted that the pupils were dilated and did not react to light and she was unable to tell when a light was flashed into her eyes.

It was therefore decided to consult an eye specialist, and Dr. F. Phillips reported that the optic disks were rather pale, but that there were no exudates or hæmorrhages and the arteries were small.

Twenty-four hours later the patient could perceive light and the pupils began to react slightly. After a further twenty-four hours she could distinguish hand movements and the fields of vision appeared to be normal by confrontation test. The pupils reacted briskly to light and accommodation and the fundi were normal. The vision gradually improved and was almost normal when the patient left hospital; it was quite normal when the patient was examined two months later.

Comment.

The sudden loss of vision was at first thought to be due to retinitis, but examination excluded this. The loss of pupil reflexes suggested optic neuritis. This was excluded by the fact that the vision recovered so quickly and completely. The final diagnosis of uræmic amblyopia was therefore made. Loss of light reflex is not common with this condition, but can occur. In a case such as this the prognosis becomes the chief concern of the relatives and doctor, and it is presented that others with a similar case may take comfort.

Reviews.

ZINSSER'S TEXT-BOOK OF BACTERIOLOGY.

ZINSSER'S authoritative book on a subject which forms part of the actively growing edge of medical science is now completely revised by a team of workers from Duke University, North Carolina, in its ninth edition.[1]

The purpose of the book is expressed in its subtitle: "The application of bacteriology and immunity to the diagnosis, specific therapy and prevention of infectious diseases for students and practitioners of medicine and public health." Its arrangement follows the customary pattern found useful for this purpose. It is the most up-to-date publication received in this country, because it follows the recently issued 1948 edition of Bergey's "Manual of Determinative Bacteriology", the recognized authority on taxonomy and classification of bacteria, which was recently reviewed in these columns.

Naturally the sections on the filterable viruses and the diseases which they cause are the most notable additions to the text. The chapter on the nature of viruses and virus inclusion bodies and virus morphology is profusely illustrated with pictures taken from electron microscope photographs, the magnifications ranging up to the order of 90,000 times; these are the most beautiful reproductions we have seen. Diseases caused by viruses are grouped according to the tissue which they affect, and the extremely comprehensive list of references appended at the end of each chapter includes all the most modern work.

There is a section on medical mycology, that important group of diseases which seem to be such a trial to the routine worker in a bacteriological laboratory, and following the modern classification actinomycosis finds its place here. Once again the photographs are admirable.

The inclusion of a section on technical methods in such a text-book always provokes argument, and the present occasion is no exception to the rule. A mere fifty pages is quite inadequate for the purpose, and detailed criticism would be pointless. However, it may be remarked that the special problems created in diagnostic techniques by the use of antibiotic and bacteriostatic drugs before blood and other biological material have been collected surely deserve mention in the chapter on antibiotics and treatment. In general the attempt to compress into such a small space the wealth of detail required if remarks on technique are to be useful merely irritates the experienced worker.

Considered as that of a text-book, the standard of the book as a whole calls for nothing but praise. The binding, paper and printing are admirable, the type-setting is clear and attractive. One could wish that the international currency situation were such that this could be a standard text-book for the teaching of bacteriology to medical students in Australia.

[1] "Zinsser's Textbook of Bacteriology", revised by David T. Smith, M.D., Donald S. Martin, M.D., M.P.H., Norman F. Conant, Ph.D., Joseph W. Beard, M.D., Grant Taylor, M.D., Henry I. Kohn, Ph.D., M.D., and Mary A. Poston, M.A.; Ninth Edition; 1948. New York: Appleton-Century-Crofts Incorporated. 9½" × 6½", pp. 1044, with illustrations. Price: $10.00.

HOW OPHTHALMOLOGY BECAME A SPECIALTY.

A LITTLE more than fifteen years ago a distinguished teacher and practitioner of that highly specialized science and art which treats of diseases of the eye, set out to enlighten his professional colleagues in regard to the historical foundations upon which the imposing superstructure of modern ophthalmology has been slowly and falteringly built up. In a small volume of one hundred pages under the title "A Short History of Ophthalmology", Dr. Arnold Sorsby, who occupies the responsible position of Research Professor at the Royal College of Surgeons of England, has succeeded in concentrating a complete survey of a long sequence of discoveries which form the true background of this important specialty. That Dr. Sorsby's careful work has not gone altogether unappreciated is evidenced by the fact that a second edition of his fascinating book has just been published.[1]

In a short introductory chapter an interesting account is given of the strangely primitive concepts concerning diseases of the eye which physicians of early civilizations derived from supernatural beliefs, weird superstitions and the prevalent use of magic. In the Greek period these semi-religious notions were deliberately discarded for a more realistic attitude to natural phenomena and a rational approach to their understanding of ocular disease. Many of the Hellenistic traditions came to light many centuries later in the translations and philosophical dissertations of the practical Arabian physicians, who established flourishing ophthalmic clinics in their fabulously large general hospitals. And so we learn of the extension of this preliminary knowledge to the Western world, of the definite progress made during the Renaissance, which gradually led up to the rapid developments of modern times.

In the chapters that follow, reference is made under separate headings to the facts of anatomy, physiology and pathology elicited through the ages, and here a special interest is created by the inclusion of several anatomical diagrams showing the structures of the human eye as represented in the writings of Hippocrates, Celsus, Galen, Vesalius

[1] "A Short History of Ophthalmology", by Arnold Sorsby, M.D., F.R.C.S.; Second Edition; 1948. London: Staples Press, Limited. New York: Staples Press Incorporated. 7" × 4", pp. 116, with illustrations. Price: 8s. 6d.

and the later anatomists. The subsequent chapters deal with the special topics of cataract, glaucoma, methods of treatment, the invention and adaptation of spectacles, the ophthalmoscope, and, lastly, a survey of the development of ophthalmology in the British Isles.

This little book represents a great deal of painstaking research and should be studied by every practitioner of this specialty. Actually the story should have a real interest for all medical practitioners in view of the fact that increasing emphasis is being placed on the necessity for knowing something about the historical background for a sound comprehension of any important human activity.

SLIT-LAMP MICROSCOPY.

"OCULAR SIGNS OF SLIT-LAMP MICROSCOPY", by James Hamilton Doggart, is a book which is a credit to the author and to British ophthalmology.[1] Since World War II Doggart has not only produced this volume under review, but he also has to his credit two other volumes. Firstly, we read in 1947 "Diseases of Children's Eyes", and secondly, in 1948, "Children's Eye Nursing", both of which originated from his work as ophthalmic surgeon at Great Ormond Street Hospital for Sick Children. His third volume, which we gladly review, gives us the fruits of his keen observations as ophthalmic surgeon to Saint George's Hospital and Moorfields Eye Hospital (Royal London Ophthalmic).

There is a no more attractive volume in ophthalmic literature than one on the slit-lamp microscopy of the living eye, and the 85 coloured illustrations in this work of Doggart are extremely well done, and are a great credit to British medical artistry and British publication. They show how essential today a good technical staff is to medical literature.

In the pages of this short monograph, two omissions of particular interest to Australian ophthalmology might be pointed out. The first is the omission of a slit-lamp drawing of *keratitis sicca*, which is no longer a rare condition in this continent, and the second is the omission of a drawing of cataract in the infant following rubella in the pregnant mother. These are just minor points, but it is imposible to find any major omissions in this volume, which brings the study of slit-lamp microscopy within the reach of all surgeons interested in ophthalmology.

PRIMARY ANATOMY.

"PRIMARY ANATOMY", by Professor H. A. Cates, of the University of Toronto, is written for nurses, physiotherapists, occupational therapists, and health and physical educationalists.[2] Although the needs of these groups vary, the author believes that the systematic approach to the elementary study of anatomy is less difficult than a regional one, and, furthermore, to suit those for whom the book is written, the greatest attention is given to the skeletal, articular, muscular, circulatory and nervous systems.

The author asks: "Can any worthwhile knowledge of anatomy be acquired without access to anatomical material?"

The book consists of twelve chapters: on the beginning of life, skeletal system, articular system, muscular system, digestive system, urinary system, generative system, circulatory system, nervous system, eye and ear, and skin and endocrine glands.

The first chapter, which is very well done, commences with protoplasm and the cell, and goes on to deal with structure and function, microscopic and macroscopic, and comparative anatomy and embryology.

Throughout the book the author draws skilfully upon embryology and comparative anatomy to aid the student to obtain a rational appreciation of the subject.

The section on the muscular system is probably the best, and is illustrated with numerous line drawings showing the origin and insertion of single muscles and groups of muscles. Of the lower limb muscles, the author states that it is in the light of functional demand that the disposition and uses of the muscles should be studied. More attention might be paid to this principle in dealing with the upper limb.

The structural account of the various articulations is very satisfactory, but it appears a little out of date in descriptions of movements of the shoulder joint and wrist joint. A fuller account of them, and also of the movements of the fingers, is desirable.

The chapter on the circulatory system is highly satisfactory, though a fuller account of the venous system in the lower limb would be an improvement, as *Homo sapiens* is so prone to suffer from varicose veins.

Most of the line drawings very adequately illustrate the text, but there are some that might be improved on in later editions—Figures 141, 149, 325 and 331. Some of the illustrations in Figure 392 are not up to the standard of the others.

The book is of handy size and very well printed, and is the best of its kind we have seen. It would be a good introductory book for medical students as well as being of value to those for whom it was written.

PLASTER OF PARIS TECHNIQUE.

A KNOWLEDGE of the use of plaster of Paris is essential to the majority of doctors today, and "Plaster of Paris Technic" by E. O. Geckler is an excellent book for anyone who wishes to use plaster to its best advantage.[1] There have been only a few minor additions to the second edition, but the author has made even more satisfactory a book which was already a very good and detailed account.

The use of plaster is an art which can be learnt only by practice, but this book is full of the finer points of technique that help so much to make plastering a success. The methods described are satisfactory and safe and if faithfully followed will give both the doctor and the patient comfort and freedom from worry. The dangers of the use of plaster are very well covered, and the safety of using adequately padded and split plasters is a very important point. The question of padding plasters has often been debated, but the methods described here will protect the parts from injury and yet not interfere with the efficiency of immobilization. The advice to split or bivalve plasters on limbs that are likely to swell is excellent. It does not interfere with the cast's efficiency and may save the practitioner considerable difficulty and worry. In this edition the author points out that circular bandages and dressings under a plaster are sometimes a source of trouble that is liable to be overlooked. If they become soaked in serum or blood they readily lead to constriction and a split plaster may give a false sense of security unless everything that encircles the limb is divided.

The details of the various methods used and of their application are very clear and concise and at the same time all the essential points are given. The author is to be congratulated on covering the field so adequately in such a few words and in such a readable manner. The book is well illustrated by excellent photographs that are really helpful.

PSYCHIATRY IN GENERAL PRACTICE.

THE author of "Psychiatry in General Practice", Dr Melvin W. Thorner, has made a valiant attempt to present the problem of the psychiatric patient in "language that is purposely simple and non-technical".[2]

The book, according to the foreword by Dr. C. Charles Burlingame, "makes complicated things simple". As a result, it carries the implication that psychotherapeutics is also simple—an implication which unfortunately is far from the truth. The book succeeds admirably, however, in presenting the various types of personality disorders and psychiatric syndromes without the use of the usual psychiatric jargon. The case histories are excellent—they are presented in detail and written in a vivid way that presents the patients as real people and not merely as illustrative robots. These case histories comprise some two-thirds of the total book.

The book is divided into two main sections. The first is devoted to a discussion of the various types of people who

[1] "Ocular Signs in Slit-Lamp Microscopy", by James Hamilton Doggart, M.A., M.D. (Cantab.), F.R.C.S. (England); 1949. London: Henry Kimpton. 9" x 5", pp. 132, with 93 illustrations, 85 coloured. Price: 21s.

[2] "Primary Anatomy", by H. A. Cates, M.B.; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 494, with 392 illustrations. Price: 45s.

[1] "Plaster of Paris Technic", by Edwin O. Geckeler, M.D.; Second Edition; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 240, with 236 illustrations. Price: 22s. 6d.

[2] "Psychiatry in General Practice", by Melvin W. Thorner, M.D., D.Sc.; 1948. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" x 6", pp. 680. Price: 56s.

XUM

are likely to present as psychiatric problems—"dreamy people", "confused people", "dementing people", "suspicious people" and the like. There are excellent chapters on "older people" and on "the rest of us"—those with temporary deviations from the normal that do not conform to any accepted diagnostic label.

The second main section deals with methods of examination and treatment. The latter includes chemotherapy, physiotherapy, shock therapies, prefrontal lobotomy and psychotherapy. The author rightly regards the last as the spearhead of all psychiatric treatment.

In such a book there are naturally small details with which one disagrees. The physical examination recommended for all patients is so detailed as to be quite impracticable—and it cannot be agreed that an examination of the genitalia should be an "integral part of the psychiatric examination" of female patients. The suggestion that alcohol should be deliberately prescribed to ease emotional difficulties is dangerous—and the last condition of the patient is likely to be infinitely worse than the first. The use of "Tridione" in epilepsy is recommended, but the associated dangers are not mentioned.

In general, the book succeeds in its objects, and might be read with benefit, not only by the general practitioner, but by psychiatrists also, and by those engaged in ancillary services when the understanding of the emotional problems is necessary.

SEX PROBLEMS IN SCHOOL.

"SEX PROBLEMS IN SCHOOL" was written shortly before the war of 1939 by Dr. Allendy and Madame Lobstein, two French psychoanalysts of the Freudian school.[1] Egon Larsen translated the book into English in 1948.

The authors' deliberations are based on investigation of conditions existing among the French middle class prior to the war.

The book covers every phase of sexual development and activity from the earliest stages until school leaving age, and deals with the abnormal manifestations that are likely to arise in any school from time to time. It is a pity that sweeping statements and numerous psychopathic case histories convey the impression that abnormality is to be found on every side, rather than being the exception to the rule. No doubt the cases quoted to illustrate the far-reaching and sometimes tragic results of the mishandling of this most important side of a child's life carry their own warning, but the writers do not emphasize what should be the usual reactions and normal development of a healthy child. To speak of "this generation of unhappy children who will grow up to be another generation of neurotic adults governed by fear, repression and sadism" seems unduly pessimistic.

The suggestions put forward for handling the fundamentals of sex education are in line with the attitude of present-day educators. A fuller discussion of the more constructive and positive aspects of this subject would make the book of much greater practical help to parents and teachers who realize what could and should be done and still search for factual information to assist them in this task.

CARDIOLOGY.

IN endeavouring to compress a large subject into a small volume an author is confronted with many difficulties, but in "An Introduction to Cardiology" Geoffrey Bourne has dealt with them very successfully.[2]

In contrast to the familiar pocket edition, consisting of a series of staccato utterances interspersed with statistics and tables, his book is one which may be read with pleasure as well as profit.

He makes it clear that, as it is neither desirable, nor indeed possible, to include all the detailed information found in a book of reference, he is not going to attempt to do so. He wisely makes cardiac function and failure the central theme, so that in successive chapters he can direct attention to the manner in which these are affected by different groups of nocuous mechanisms, for example, injury to the myocardium by various means, handicaps imposed by irregularities, by mechanical factors such as valvular and pericardial affections, and by arterial disease *et cetera*. He has achieved his aims to engender understanding of principles involved, rather than to provide a pabulum of minute details for parrot-like ingestion, and to promote and stimulate interest in clinical investigation and assessment. Occasionally he has been unable to resist the urge which impels authors of text-books to include under treatment a series of remedies which "have been used", but he does add "without much apparent success".

It is inevitable that some omissions will surprise one group, while others will receive more attention from another.

For example, penicillin has not been mentioned for the important part it plays in holding the fort while the organism recovers from agranulocytosis due to thiouracil. The author's remarks on the subject of adherent pericardium smack somewhat of the old school who placed greater weight on the mechanical effects than does one section of cardiologists. It is felt that the disadvantages of potassium thiocyanate might have been stressed more emphatically.

It is easy to criticize a work, but, in spite of any minor weakness, this is a most readable book which has been based on the lectures and clinical teaching of a man of sound experience and up-to-date knowledge. It has thus acquired an almost personal flavour, as though the author were actually discussing the subject with the reader. We can heartily recommend its study to all interested in the subject.

VISION AND THE EYE.

ALTHOUGH "addressed primarily to the non-specialist", Dr. Pirenne's little book "Vision and the Eye" will prove of great interest to the student of ophthalmology.[1] Without attempting to cover the whole field, the author, after a short histological survey, discusses the results of recent research into the physiology of the eye. Well known for his work on the quantum theory, he presents this in a particularly attractive manner. He is as much at ease with the intricate researches of Hartline and Granet on the electric currents of the retina as he is with the more primitive but epoch-making experiments of Leonardo da Vinci and Scheiner.

Rarely have brevity and lucidity been combined so well as in this little book. Its convenient size is an added attraction. No better introduction could be found to the study of the physiology of vision.

AN INTRODUCTION TO SURGERY.

As with former editions of Morison and Saint's book, criticism of the fourth edition is mainly confined to the comment that the expressed plan to aid the student to think out for himself the problems presented to him in the wards and in his text-books is not consistently followed.[2] Perhaps the recent death of the senior author is responsible for a sentimental desire on the part of Professor Saint to refrain from any gross revision. There is still the tendency to revert to the style of a standard text-book of surgery, and detail is introduced without any obvious bearing on principles. Some of this detail will not find general approval in this country, and some of it is not quite up to date—for instance, few surgeons would prefer the use of "BIPP" to modern chemotherapeutic agents and antibiotics in the treatment of recent wounds. In this country the Kimpton flask is so rarely used for the transfusion of blood that few students would recognize it, yet it retains its mention almost to the exclusion of more modern systems. The inclusion of a relatively extensive section on syphilis, with details of treatment, is somewhat inconsistent with the plan of the book. In other respects, however, the book is splendid. The illustrations, which are numerous, are excellent—some of them are classics. It might well prove a more useful book for the teacher of surgery than the student.

[1] "Sex Problems in School", by René Allendy and Hella Lobstein, translated from the French by Egon Larsen; 1948. London: Staples Press, Limited. 7¼" × 5", pp. 186. Price: 10s. 6d.

[2] "An Introduction to Cardiology", by Geoffrey Bourne, M.D., F.R.C.P.; 1949. London: Edward Arnold and Company. 8½" × 5½", pp. 276, with 65 illustrations. Price: 18s.

[1] "Vision and the Eye", by M. H. Pirenne, Dr.Sc. (Liège), Ph.D. (Cantab.) (Frontiers of Science Series, General Editor, Bernard Lovell, O.B.E., Ph.D., F.Inst.P.); 1948. London: The Pilot Press, Limited. 7" × 5¼", pp. 212, with illustrations, some of them coloured. Price: 12s. 6d.

[2] "An Introduction to Surgery", by Rutherford Morison, M.D., F.R.C.S. (Edinburgh), F.R.C.S. (England), M.A., D.C.L., LL.D., and Charles F. M. Saint, C.B.E., M.D., M.S., F.R.C.S., F.R.A.C.S.; Fourth Edition; 1948. Bristol: John Wright and Sons, Limited. London: Simpkin, Marshall (1941), Limited. 8¼" × 5¼", pp. 342, with illustrations, some of them coloured. Price: 42s.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

SPECIAL GROUPS.

IT is inevitable that in their pursuit of knowledge medical practitioners interested in one particular branch of medicine shall wish to study it in the company of others with the same interests. This is recognized in British Medical Association circles and "Sections" are formed within the framework of the Branches for the study of special subjects. The desire for collaboration in study of this kind may go beyond the boundaries of a Branch so that members of different Branches may meet as members of a special organization. To enable this to be done, what are known as Special Groups have been formed. For example, the Ophthalmological Society of Australia (British Medical Association) is a Special Group and so is the Australian Society of Anæsthetists. The latter used to be what we have chosen to describe as an extramural association, but its members decided that they would have a more satisfactory existence if they dropped their independent status and took on that of a Special Group. The idea of Special Groups is spreading—at the meeting of the Federal Council in March, 1949, approval was given to a request by the Oto-Rhino-Laryngological Society of New South Wales for the formation of a Special Group to be known as the Oto-Rhino-Laryngological Society of Australia (British Medical Association) and an inquiry was received from the Section of Clinical Pathology of the Victorian Branch about the procedure to be adopted in the formation of an Association of Clinical Pathology within the ambit of the British Medical Association. The advantages to be gained by the existence of Special Groups should not need emphasis. They are those of strength based on a foundation common to all the individuals concerned. This common foundation makes organization and reunion much simpler than they would otherwise be. Both the Australian Society of Anæsthetists and the Ophthalmological Society of Australia used the framework of the Australasian Medical Congress, held at Perth last August, for the purposes of their annual meetings. They were able to take part in a happy and successful reunion of the whole profession and by so doing did something to strengthen the corporate spirit of the profession and its scientific outlook at a time when added strength was particularly valuable. There is another point which has frequently been stressed—Special Groups are concerned with the study of their special subjects from the scientific side. If medico-political activities have to be undertaken they are the care of the Federal Council acting on behalf of the Special Groups and for the whole profession. This means that in medical politics the profession speaks with one voice and not with many. The desirability of the single voice has been recognized by The Royal Australasian College of Physicians and the Royal Australasian College of Surgeons, neither of which concerns itself with medical politics. The reason generally given by those who wish to form special organizations apart from the British Medical Association is the idea that as separate units they will enjoy a degree of freedom in the control of their affairs that they would not otherwise have. Our present purpose is to set out some of the requirements governing the institution and control of Special Groups and to show that there are no irritating restrictions to be feared.

Special Groups are created after an application in writing has been made to the Federal Council by Branch members. This application may be the result of an invitation by the Federal Council or it may be made by members on their own initiative. The application must specify four things: (*a*) the objects, scope and purposes in respect of which it is desired to form the special group; (*b*) the qualifications to be required of, and the conditions, limitations or restrictions (if any) to be imposed upon, persons to be admitted to membership; (*c*) the title or name by which the Special Group is to be known; (*d*) the name and address of a person who is to serve as acting secretary of the Special Group. The application must also contain an undertaking that the Special Group will observe and comply with the by-laws of the Federal Council which are applicable to Special Groups. The application is submitted to the Federal Council, which may approve of the application as it stands or may impose any conditions or limitations which it may think proper in regard to the formation or operation of the proposed group. No person can be eligible to become a member of the group unless he is a Branch member and possesses the qualifications for membership which have been approved by the Federal Council. Any Branch member who wishes to become a member of a Special Group and who possesses the qualifications required for membership shall on making the required application be admitted as a member. Should any dispute arise in regard to the possession by a Branch member of the qualifications entitling him to membership, the dispute must be referred to the Federal Council and the decision of the Council is to be final and conclusive.

The question of membership is the point on which most objections to Special Groups are found to be based. It is held that persons not strictly qualified for inclusion have sometimes to be admitted to membership. Consideration will show that matters may be so arranged that this objection will not be valid. At the institution of the group the qualifications for membership together with the conditions, limitations or restrictions (if any) may be so laid down that only those really eligible will conform to them. Once these are approved by the Federal Council unqualified persons can be refused admission. If the

Federal Council does not approve of the qualifications and conditions desired by the initiators of the group, these persons may, if they wish, abandon the proposal. Rumours are current that a body of pædiatricians covering the whole of Australia is to be brought into being and that opinion is divided whether the organization is to be within the ambit of the British Medical Association or outside it. The explanation that has been given will, it is to be hoped, influence those at the head of the new project to come into the common fold and strengthen the scientific side of the British Medical Association's activities. But the message is also intended for others. At its recent meeting the Federal Council resolved, at the instance of the Victorian Branch, to initiate negotiations in an attempt to bring special bodies within the British Medical Association's sphere of influence. The more widely the conditions governing the formation of Special Groups are understood, the fewer "extramural" bodies will there be, and the stronger will grow the main stem on which the corporate life of the medical profession in Australia must ultimately rely.

Current Comment.

A NEW DRUG OF THE CURARE TYPE.

THE use of *d*-tubocurarine as a muscle relaxant is now well established, particularly in relation to anæsthesia. Preliminary trials have been made, on behalf of the anæsthetics committee of the Medical Research Council and the Royal Society of Medicine, of bistrimethylammonium decane diiodide (decamethonium iodide) as a substitute for *d*-tubocurarine, and, although the work is not yet completed, a preliminary report has been made by G. Organe[1] because of the placing of decamethonium iodide on the market. Proprietary names of the drug, which is also known as C10, are "Eulissin" and "Syncurin". Organe states that it is a simple compound chemically, cheap, and easy to prepare in a pure state. It is miscible with the alkaloids, with procaine, and with thiopentone. It is non-irritant and may be injected into any tissue without sign of reaction. It has been used at the Westminster Hospital in 150 operations of many different types, most of them being laparotomies, on patients aged from fifteen to eighty-three years. Experience of its use in anæsthesia so far suggests that it is a safe and effective substitute for *d*-tubocurarine and free from undesirable side-effects. It is roughly five times as potent as *d*-tubocurarine, but has a shorter effect. The total dose used has been from 1·5 to 10·0 milligrammes. A single intravenous injection of three milligrammes in light surgical anæsthesia produces, in most patients, good muscular relaxation without unduly depressing respiration. An injection of four milligrammes often, and of five milligrammes almost always, produces apnœa lasting usually ten and occasionally twenty minutes. Its action is relatively evanescent and therefore, perhaps, more controllable; further injections are made at intervals of ten to forty minutes, as required. Although it has not been needed, an effective antidote exists, the related pentamethonium iodide used in doses ten times those of the decamethonium iodide. It is interesting to note that amongst other procedures in which its use has been satisfactory are Cæsarean section and external version. Accompanying Organe's report is an account by D. L. Davies and A. Lewis of an investigation of its effect on respiration and of its suitability for reducing the force, and therefore the risks, of convulsions that are induced in the treatment of certain mental disorders. The effects of moderate doses as observed on eighteen patients were clinically almost indistinguishable from those of *d*-tubocurarine chloride; although the efficiency of respiration was impaired by both drugs in large doses, decamethonium iodide spared the diaphragm more. Administered with thiopentone to a series of patients who were being treated by electrically induced convulsions, it has proved "safe, effective for this purpose and without disagreeable side-effects". Davies and Lewis sum up its advantages over *d*-tubocurarine chloride in convulsant therapy as follows: (i) it has no untoward effects, notably in not producing the bronchospasm caused in one patient by the older drug; (ii) it is readily miscible with thiopentone; (iii) it is simple to prepare and cheap. These appear to be real advantages, so that we may well hear more of decamethonium iodide in relation to both anæsthesia and convulsant therapy.

Two further reports[1] are of interest. A. J. H. Hewer, B G. B. Lucas, F. Prescott and E. S. Rowbotham have used decamethonium iodide as a muscle relaxant in surgical anæsthesia in 85 cases. They found that it produced adequate muscular relaxation for major surgery, but only in doses which produce respiratory paralysis—a point on which they differ from Organe. However, they consider that there is a wide margin of safety, provided that adequate pulmonary ventilation is maintained. Its effect is transient, but this is an advantage in some ways and repeated doses have no cumulative effect. There were no significant side-effects and, in particular, bronchial or laryngeal spasm was not observed and intradermal injection of the drug did not produce the characteristic histamine weal and flare produced with *d*-tubocurarine. One interesting finding of Hewer and his colleagues was that pentamethonium iodide, described by Organe as a specific antidote, proved to be of little value in that role, and in three cases its autonomic blocking effect caused an alarming degree of circulatory collapse; they concluded, justifiably it would seem, that this reputed antagonist has no useful place in anæsthetic practice. The comparative value of decamethonium iodide and *d*-tubocurarine in controlling electrically induced convulsions was studied by J. A. Hobson and F. Prescott with results that support the favourable findings of Davies and Lewis. Hobson and Prescott also had been concerned with the problem of bronchospasm, and the absence of this side-effect, as well as the more rapid disappearance of the curarization, when the newer drug was used, convinced them that it was to be preferred to *d*-tubocurarine. All the satisfactory effects of the other curarizing drugs were produced by decamethonium iodide. So far, then, it seems to have gained the approval of all its investigators.

[1] *The Lancet*, May 7, 1949.

THE USE OF QUINIDINE IN HICCUP.

HICCUP has been the subject of comment from time to time in literature ranging from fiction to medical journals. It may be merely a social embarrassment, a time-worn cause for jesting, or an ominous clinical sign. The number of different causes of this uncomfortable phenomenon is legion, for it may arise from disturbances affecting the central or peripheral nervous system, or the organs in the chest or the abdomen, from infections, or from the presence of toxic products in the body fluids. The number of forms of treatment is correspondingly large, and these range from domestic manœuvres, some of them grotesque, to surgical procedures. Samuel Bellet and Carl S. Nadler,[2] in treating patients in the cardiac wards of a large general hospital, noticed that the exhibition of quinidine to patients with severe hiccup occurring in relation to cardiac and renal insufficiency caused the cessation of the hiccup. At least hiccup which would not respond to such measures as sedatives, antispasmodics, oxygen and carbon dioxide, disappeared each time the drug was given. The first patient was given fifty grains of quinidine in a period of nine days, and relief followed within two hours of each administration. Cardiac irregularity due to extrasystoles was also controlled. The next patient, who had advanced

[1] *The Lancet*, May 14, 1949.
[2] *The American Journal of the Medical Sciences*, December, 1948.

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caseous tuberculosis of the lungs and prerenal azotæmia, was relieved by a single intramuscular dose of nine grains of quinidine, followed by maintenance doses given by mouth. In another case the intravenous route was chosen, as it was found that parenteral administration was more satisfactory than the oral method. The initial success with a patient who was in any case a good subject for the use of quinidine, led the authors to try the effect of the drug in a variety of conditions, the only common factor being the existence of inveterate hiccup. Nine patients were so treated; only in one instance did the method fail entirely; in two it was only partially successful, but in the remainder the result was very satisfactory. In discussing the probable mechanism, Bellet and Nadler point out that their small series suggests that the best results should be expected from high dosage over a short period of time so as to ensure high concentration in the body. Their experience being so limited, they can suggest only the optimum dosage, but place this tentatively at ten grains given intramuscularly, repeated every hour for two or three doses. A low maintenance dose may be given thereafter if needed. They do not advise that the drug be used for all patients, but think it is worth trying for all patients who persist with hiccup in spite of the trial of all other ordinary methods. The mechanism of action is probably bound up with the effect of quinidine on striated muscle in lengthening its refractory period. The pharmacology of quinine and related substances is briefly reviewed in this article; two familiar clinical points may be recalled here, the value of quinine in *myotonia congenita*, and also in the relief of night cramps of the extremities. In a brief after-note the authors justly remark that where hiccup is associated with abdominal conditions which have necessitated operation, it is most important to relieve any imbalance in the electrolytes, as this may be an important factor. This may surely be taken for granted in the light of modern post-operative treatment for abdominal lesions. But it seems as if some further trial of quinidine and its relations may be worth while in an attempt to relieve a condition which can be extremely distressing, especially to a patient severely ill.

NITROGEN MUSTARD THERAPY.

RECENT medical literature has contained many references to the use of one or other of the nitrogen mustards in the treatment of the Hodgkin lymphosarcoma group of neoplastic diseases. This is one of the very few advantages accruing from the study of the action of substances devised for chemical warfare. The other outstanding dividend from this scientific advance in allegedly civilized communities is the introduction of BAL for arsenical and certain other metallic poisonings. We should, however, be thankful for the beneficent effect of the nitrogen mustards, since they have stimulated thought on a very controversial subject. It has in the past been gratifying to see how rapidly radiosensitive tumour masses shrink and disappear under correctly applied irradiation, but depressing to witness the inevitable recurrences. Of course, we are here opposed to a biological principle, for it seems as if the Mr. Hyde among bacteria, viruses or metaplastic cells is nearly always present and potent, and ready to rally his assaults against the weaker Dr. Jekyll presiding over the destinies of the body's mutable protoplasm. Varying the metaphor, there are left a few cells which, "stout as Julius Cæsar", are proof against the wave-lengths of the radiotherapist piper. It is in the renewed attack on these that the nitrogen mustards have been temporarily successful, the response being sometimes dramatic. Review of the literature shows now an imposing number of encouraging results, even if they are not lasting. A couple of these may be quoted. Andrew H. Meyer and W. C. Overmiller report[1] two cases of Hodgkin's disease and three of lymphosarcoma treated with the methyl bis (chloroethyl) amine hydrochloride. The former patients remain well after eight to ten months; two others who died were relieved substantially for a time. The toxic effects known to be not infrequent accompaniments of the drug occurred more or less in all these patients, but were not a source of anxiety. These are, as is now well known, connected chiefly with the bone marrow, whose blood cell forming functions are deranged and depressed by the drug, chiefly within the first three weeks after administration. Local effects are not serious if care is taken to prevent escape of the solution from the vein used for the injection, and symptoms such as vomiting and diarrhœa are only transitory.

S. Ben-Asher reports a series of some size, part of which is being collected for the National Research Council of the United States of America.[1] Twenty-nine patients were studied, suffering chiefly from Hodgkin's disease, but also from lymphosarcoma and different varieties of leuchæmia. Most of the patients with Hodgkin's disease were in the advanced stages, and had had previous X-ray treatment, but most of them had remissions from one or more courses of nitrogen mustard. In a few cases in which the condition had been shown to be resistant to irradiation the results were striking. In lymphosarcoma and the different types of leuchæmia the results were not so good, and remission was often soon followed by relapse and death. A series of patients with carcinoma of the lung were also included, but it is hardly surprising that with them no good results were obtained. Toxic effects of the drug on bone marrow function were observed, but were not severe. Toxic nausea and vomiting were commonly seen, but sedation before treatment lessened this complication. It seems from results such as these that some differentiation may now be made between the types of lymphoid neoplasms which may be expected to respond to nitrogen mustard and those which may not. This brings us back to one of the highly controversial subjects in connexion with this group of diseases, their classification. There is clear evidence of recent years that medicine has suffered from being too highly descriptive. It is freely admitted that a true ætiological classification is not possible, at least not when widely applied to the whole clinical field, but there has been too much deference to the so-called "classical" pictures, whether these relate to a clinical syndrome or to the histological or biochemical findings in body tissues or fluids. Even so simple an example as the mutability of epidemic disease illustrates this.

R. P. Custer and W. G. Bernhard in a recent article plead for a more comprehensive view of the Hodgkin lymphosarcoma group.[2] They point out that as far back as 1907 Coley suggested that lymphosarcomatosis would be a better name for Hodgkin's disease, and that the many histological arguments that have been brought up since have laid emphasis on the need to recognize the reticulum cell as the parent from which a number of neoplastic variants spring. Cases may be found in the literature of reticulum cell sarcoma with a clinical picture of either lymphatic or monocytic leuchæmia, and, though it may seem at first somewhat remote, *mycosis fungoides* has also been brought within the same classification by some authorities. Leuchæmia in particular is overdue for some revision of definition and outlook; it is still usually described as a condition in which an increase of the peripheral white blood cells is present. Custer and Bernhard state that the descriptive terms generally employed in this wide group of disorders should "designate the predominating histologic pattern of a lymphoma at the time of a particular examination of tissues or blood". In a series studied by them they found that the histological pattern underwent virtually complete alteration in 39% of 138 cases in which biopsy was carried out and autopsy was performed later. Although it is more difficult to think in terms of pathological changes, especially when these vary, truth in diagnosis and hope in therapy are more likely to be attained if this is done. It needs more mental effort than does the use of well-worn pigeon-holes, and may perhaps increase possible attrition with patients' friends and with an inquisitive lay Press seeking "tabloid" information, but it should be worth while.

[1] *Annals of Internal Medicine*, February, 1949.

[1] *The American Journal of the Medical Sciences*, February, 1949.

[2] *The American Journal of the Medical Sciences*, December, 1948.

XUM

Abstracts from Medical Literature.

THERAPEUTICS.

Discontinuous Therapy with Penicillin.

R. TOMPSETT, A. TIMPANELLI, O. GOLDSTEIN AND W. MCDERMOTT (*The Journal of the American Medical Association*, February 26, 1949) have studied the therapeutic effectiveness of discontinuous penicillin therapy, consisting of one or two daily doses of penicillin in aqueous solution. They state that this form of treatment appears to provide entirely satisfactory therapy for the great majority of penicillin-susceptible infections, but emphasize that it would presumably be inadequate in the treatment of serious staphylococcal infections, bacterial endocarditis and other infections which usually require large quantities of penicillin. It may also not be as satisfactory as intensive continuous therapy in the prevention of non-suppurative complications of group A hæmolytic streptococcal infections. Their observations in two cases of pneumococcal meningitis suggest that certain suppurative complications which occur in patients receiving continuous treatment may occur more frequently if discontinuous treatment is employed. Nevertheless, the clinical results observed in the treatment of pneumococcal pneumonia and other frequently encountered infections indicate that highly effective penicillin treatment may be provided by discontinuous therapy without the rigid restrictions imposed by conventional dosage.

W. WEISS AND I. STEINBERG (*The American Journal of the Medical Sciences*, January, 1949) report treatment in 30 cases of pneumonia with one daily intramuscular injection of aqueous penicillin G (300,000 units). In 26 cases pneumococci were found in the sputum, in 18 cases crisis resulted and in nine lysis, and one patient failed to respond to the treatment; two patients died. Pleural effusion occurred in two cases, and delayed resolution in three. The authors compare their results with those obtained from smaller doses at more frequent intervals, and conclude that their own results are at least as good.

Hypertension and Low Sodium Intake.

B. ROSENBERG, A. E. ROSENTHAL AND M. B. ROSENBLUTH (*The American Journal of Medicine*, December, 1948) report the treatment by diet of nine patients with hypertension. Seven patients received a diet with a low sodium content and adequate protein, four receiving the rice diet in addition to this, and one receiving the rice diet alone; in one case observations were discontinued because the patient did not adhere to the diet. In four cases amongst the seven patients receiving a diet of low sodium content, a statistically significant fall in blood pressure occurred; in three there was no change. Of the five patients receiving the rice diet, three had statistically significant falls in both systolic and diastolic blood pressures, but in only one case was the fall to normal values. The effect of the rice diet was only slightly greater than that of the diet of low sodium content. Despite the fall in blood pressure in five patients, there was no relief of symptoms. The authors consider that although the number of patients studied was small, the changes were not of sufficient magnitude to warrant the routine use of the type of therapy described in the management of essential hypertension.

Long-Acting Preparation of Testosterone.

E. CARLINFANTI, F. D'ALÒ AND L. CUTOLO (*The Lancet*, March 19, 1949) describe a preparation of testosterone with aluminium phosphate designed to provide prolonged action. They state that the preparation is stable and can be administered with a fine needle. It has the advantage of reducing the frequency of injections to one a month or less and obviates the need for surgical implantation of pellets.

Aureomycin in Virus Pneumonia.

Y. KNEELAND, JUNIOR, H. M. ROSE AND C. D. GIBSON (*The American Journal of Medicine*, January, 1949) have treated orally with aureomycin ten patients suffering from what they believed to be atypical ("virus") pneumonia. Eight of the patients developed cold agglutinins at the expected period in the disease. In nine cases the temperature became normal twelve to forty-eight hours after the drug was first administered, with corresponding improvement in the general condition. In two of these cases treatment was discontinued at this time, and what appeared to be a recrudescence of the disease took place. In the other seven cases treatment was maintained, and uneventful recovery ensued. No important toxic side effects were noted. The authors conclude that their work suggests that aureomycin may have an antiviral effect against the agent which causes atypical pneumonia in man.

Arteriosclerosis Obliterans.

M. T. FRIEDELL, E. F. DRUCKER AND W. J. PICKETT (*The Journal of the American Medical Association*, December 4, 1948) describe the histidine and ascorbic acid treatment of *arteriosclerosis obliterans*. They studied its effects on 25 patients treated for ten days; 13 were given orally three times a day four capsules of 0·5 gramme of 1-histidine-monochloride and 400 milligrammes of ascorbic acid; 12 were given subcutaneously every six hours five millilitres of 4% histidine in water and 100 milligrammes of sodium ascorbate, and orally each day 600 milligrammes of ascorbic acid. Skin temperature readings, oscillometric studies and radioactive isotopes were used to determine improvement in circulation in the assessment of results, but they were found to be of little use, clinical signs providing the best guide. Results of treatment were relief of pain and lessening of abnormal signs especially after subcutaneous medication.

Rheumatic Fever.

B. F. MASSELL, J. W. DEW AND T. D. JONES (*The Journal of the American Medical Association*, December 4, 1948) describe the effect of orally administered penicillin in rheumatic fever. Intramuscular treatment with penicillin had been shown to reduce the spread of hæmolytic streptococci from one patient to another in 17 out of 20 cases in a previous investigation. In the present study penicillin was given by mouth (100,000 or 200,000 units thrice daily) to patients harbouring hæmolytic streptococci. Buffered tablets of 50,000 to 100,000 units were given one hour before meals or two to four hours after meals. Patients with infections (as opposed to mere carriers) of hæmolytic streptococci were given 200,000 units five times daily for ten days. The result was rapid reduction in the number of streptococci each day with complete eradication of the organisms in eight out of ten cases. In fifteen patients with rheumatic fever who were treated as above there were no recurrences of rheumatic fever. It is suggested that penicillin might be used for prevention of hæmolytic streptococcus infections and rheumatic fever.

Streptomycin and "Promizole" in Tuberculosis.

E. M. LINCOLN AND T. W. KIRMSE (*The Lancet*, May 7, 1949) treated seven subjects of miliary tuberculosis with "Promizole". None developed clinical meningitis. Five have survived for two to four years and are free from evidence of miliary tuberculosis. Ten patients with miliary tuberculosis were treated simultaneously with streptomycin and "Promizole"; one died after six months' treatment and another of a relapse from meningitis eleven months after the initial diagnosis was made. No relapse of miliary tuberculosis has occurred in the survivors of either group. Eighteen patients with tuberculous meningitis were treated with intramuscular and intrathecal injections of streptomycin and with "Promizole" given by mouth; thirteen were still alive three to twenty-one months later, and there have been no serious neurological sequelæ. In three cases relapse occurred twenty-five to forty-three days after completion of therapy; tubercle bacilli fully sensitive to streptomycin were grown from the cerebro-spinal fluid in each case during the first week of relapse. The authors conclude from their work that the addition of "Promizole" to streptomycin is of value in the treatment of miliary tuberculous and tuberculous meningitis.

Partial Gastrectomy for Peptic Ulcer.

B. B. MILSTEIN (*The Lancet*, March 26, 1949) states that among 101 consecutive partial gastrectomies for peptic ulcer performed by eight members of the surgical unit of University College Hospital, London, the mortality was 2%; but there was a high morbidity rate, complications being recorded in 51% of cases. The low mortality is attributed to pre-operative rest, strict suture technique and post-operative gastric suction; it was maintained in spite of the inclusion of many patients who were bad "risks". Among many complications, infection, which occurred in 17% of cases, stands out as the most frequent and the most amenable to prevention.

Treatment of Burns.

D. M. GLOVER (*The American Journal of Surgery*, November, 1948) traces the story of the treatment of burns over the past thirty years in relationship to two world wars. He refers to the early use of carron oil and ointments and the later use of "Ambrine" and paraffin spray during the period of the 1914-1918 war, followed by the Carrel-Dakin

method of treating infected burns, and the introduction in 1925 of the coagulation regimen by Davidson. The use of tannic acid continued up to the period of World War II, when it fell into some disrepute in the armed forces of the Allies. Warm saline baths and the Bunyan envelope were used, and then followed the pressure dressing, which is in vogue now and is comparable in many respects to the "Ambrine" dressing of World War I. Detail is given of the method of pressure dressings and of the management of a case, with a summary of the present position of shock treatment and fluid replacement therapy in burns.

NEUROLOGY AND PSYCHIATRY.

Heredity in Homosexuality.

ROY A. DARKE (*The Journal of Nervous and Mental Disease*, March, 1948) considers the work of Lang, who presents data indicating that heredity is the ætiological determinant in homosexuality, and the study of sex intergrades as elaborated by Goldschmidt. Material for study was 100 male homosexuals at Springfield, Missouri. They were divided into groups according to the nature of their homosexual experiences and urges. It was presumed that if heredity played an important part there would be a statistical alteration in the sex relationships of their families. In spite of careful investigation the author comes to the conclusion that this study gives no evidence of hereditary ætiological determination of homosexuality in human beings. It was discovered that individuals who continued passive sodomy beyond the age of twenty-five years had a greater than expected number of female siblings.

Causes of Failure in Treatment with Electric Shock.

N. K. RICKLES AND CHARLES G. POLAN (*Archives of Neurology and Psychiatry*, March, 1948) discuss the causes for the failure of electric shock treatment in 38 cases. Their analysis shows that this type of treatment is likely to fail if the patient has always been of a suspicious, socially inadequate nature, if the patient has always shown neurotic symptoms and neurotic patterns of reaction to any environmental difficulties, if the patient has lost a marital partner on whom there has been dependence, and in reactions coloured by mania. They emphasize that this treatment is of less value when a personality factor with life-long disabilities is an important feature in the sickness.

War and an Aggressive Personality.

MORRIS H. ADLER (*The Journal of Nervous and Mental Disease*, September, 1948) explores the thesis that training for a soldier creates a dangerous individual and a threat to civilian life. He discusses a patient, admitted to hospital for homicidal impulses, who had an intense desire to kill his wife. He had a history of efficient front-line war service as a tank sergeant. Exhaustive clinical investigation showed that the patient was ill long before he entered the service. The aggressive drive could be referred to his childhood insecurity with a drunken father and an invalid sister. He had emotional frustration concerning a phimosis and circumcision. There were homosexual tendencies. The author concludes that active military service threatens the stability of the individual in terms of increased anxiety, guilt and fear of loss of control, rather than in terms of antisocial behaviour.

The Neurotic Veteran.

ARTHUR F. VALENSTEIN (*The Journal of Nervous and Mental Disease*, September, 1948) classifies into two groups the chronic neurotics who found their way into military services in thousands. The first group contains the overt neurotics of poor ego strength whose neuroticism was quickly observed. They usually achieved an early discharge from the service. The second group of basically neurotic individuals either concealed or were unaware of their neuroses whilst on service. The author finds that they have rigid personalities. They thrive in a regimented existence. Attuned to this life they cannot stand up to the indecisiveness of a civilian existence with its problems in sex relationships, child care and economic security. The author stresses the ineffectiveness of treatment in terms of combat experience, since the emphasis is on the constitutional inadequacy. There is no royal road to success. He states that the ultimate psychotherapeutic goal is to achieve, in so far as is possible, a belated emotional maturation.

Obsessional Syndrome and Depression.

E. STENGEL (*The Journal of Mental Science*, July, 1948) draws the distinction between the obsessional neurotic who is subject to recurrent depressions and the individual with obsessional personality features who develops severe obsessional symptoms in the course of a depressive reaction. He states that during the depression obsessive-compulsive symptoms tend to develop overt obsessive-destructive contents. At this time displacement and symbolization tend to break down and compulsions are directed against self and external objects. These symptoms subside with the relief of the depression. In many cases the depressive mood does not dominate the picture, but is evident by self-accusations and the fear that wrong may have been done in the past. There are two mechanisms considered, namely, the aggravating and unmasking effect of depression and the integrating influence of the obsessional personality structure on the depression. Habitual obsessions may fade during the course of the depression and be replaced by aggressive behaviour or a masochistic orgy, and in both cases the symptoms are coloured by doubts.

Carbon Dioxide Inhalations.

L. J. MEDUNA (*The Journal of Nervous and Mental Disease*, November, 1948) believes that the healthy actions of the body in the waking state consist in an optimum relationship between excitability and excitement. He believes that the basic biochemical and physiological processes underlying emotions and symbolization are essentially identical. He concludes that any procedure which increases the stimulation of the brain facilitates the homeostatic balance. For this purpose he induces anæsthesia through repeated inhalations of a mixture of 30% carbon dioxide and 70% oxygen for 20 to 40 respirations. A remarkable alteration occurs in every nervous activity. The treatment is administered three to six times per week, up to a total of 20 to 150; 20,000 treatments have been given. The author finds that it benefits neurotics with conversion symptoms, anxiety states and personality maladjustments. It is useless for psychotics and dominant overt homosexuals.

Tetra-Ethyl Ammonium Chloride.

ERIC BELL AND LOUIS J. KARNOSH (*The Journal of Nervous and Mental Disease*, November, 1948) describe the use of tetraethyl ammonium chloride as an adjunct in the treatment of psycho-visceral manifestations of anxiety. It prevents impulses passing through both sympathetic and parasympathetic ganglia. A 10% solution (up to 500 milligrammes) of the chloride salt is injected intramuscularly or intravenously. Transient paræsthesia occurs. Three to six injections per week are given to an ambulatory patient. It gives symptomatic relief from gastro-intestinal disturbances, cardiac palpitation, *globus hystericus*, excessive sweating, the secondary symptoms of insomnia and early morning fatigue. The authors use it to break the vicious circle of pattern responses and to provide a background for psychotherapy. Hysterics do not respond, and this may be a diagnostic feature. No untoward results occurred in 48 cases. The treatment is said to relieve pylorospasm, vasospasm, pain of biliary colic, ureteral colic and intestinal obstruction.

The Hysterical Personality.

OTHO W. S. FITZGERALD (*The Journal of Mental Science*, October, 1948) states that love deprivation situations experienced by the growing child create in him a habit of love craving, and this emotional dependent attitude is the basic trait from which all other features of the hysterical personality spring. An emotional conflict or crisis is the precipitation of an attack of hysteria, as it is in other manifestations of neurosis. The intensity of the precipitating factor is in inverse proportion to the previously developed tendency of love craving. The immaturity of the hysteric appears in the affective aspect and not in conation or cognition. The characteristic attitude is one of dependence and intolerance of any suspected inattention, the inference being that the person is endeavouring to satisfy a wish to remain a child. If sympathetic responses are not forthcoming then mere attention is chosen as the next best thing; to be ignored is intolerable. Failure to satisfy this love craving may be seen in marital incompatibility. Commencing as an escape from an unhappy home, hasty youthful marriages, often with an unsuitable partner, result. The insatiable love craving seeks constant assurance of love and fidelity, often to an irritating and intolerable degree, and leads finally to sexual frigidity, understandable as the child's attitude of all take and no give. Frequently hysterical persons sublimate these love craving tendencies and show real ability and interest in handling small children, in pursuits of an humanitarian type, as missionary work, nursing, and social welfare, and in histrionic activities. Love deprivation situations that are commonly met with in children are the death of a parent, parental strife, a chronically ill parent, some prolonged illness of the child, separation of the child from the parents, and disinterested parents.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on April 21, 1949, at the Royal Alexandra Hospital for Children, Sydney. The meeting took the form of a series of clinical demonstrations by members of the honorary medical and surgical staff of the hospital.

Milk Intolerance.

DR. S. E. L. STENING showed a male child, aged three and a half years, who had been first treated at the age of one month, having had jaundice since birth. Several blood transfusions were given and satisfactory progress was made. When he was about eight months old, weaning was attempted, but vomiting followed first the administration of "Lactogen" and then that of cow's milk. Three attempts were made to replace breast milk with cow's milk or dried cow's milk, but vomiting followed in each case, and the child was referred to the allergy clinic. There he was found to be apparently healthy. Skin tests were made, and reactions were obtained to milk, barley and wheat. His mother, who was intelligent and sensible, was advised that the patient reacted to cow's milk, and that weaning would have to be carried out directly on a mixed diet without milk in any form. Since it was not known whether the patient would react to new additions to the diet, the mother was advised to add each new item singly and for four consecutive days. She was advised to begin with "Farex" and potato broth, then carrot, spinach, oat jelly and egg yolk. "Farex" was found to cause urticaria; but there was no reaction to the other foods. Two months later the baby was well, but could not be persuaded to give up the breast. The mother still had plenty of milk. The child was eating vegetables and oat jelly well, and the mother was advised to withhold the breast completely. Various other items were gradually added to the diet, and the child made good progress. When the patient was aged about nineteen months, an attempt was made to introduce milk in desensitizing doses, but without success. Three months later he ate some potato which had been mixed with milk, and vomited for twelve hours; he suffered from oliguria and became practically comatose. Milk was rigidly excluded from his diet, and he was well for a further three months, when he developed facial dermatitis. The honorary dermatologist thought that this was probably due to calcium deficiency, and prescribed calcium to be given by mouth. The rash disappeared after the appearance of his molar teeth. When he was aged about two and a half years, it was found that he could eat cakes which contained up to half a cup of milk per pound of cake; but six months later he began to complain of abdominal pain, and when his mother ceased giving him the cake containing milk, the pain ceased. Onion was also found to cause acute abdominal pain. Cod liver oil was well tolerated, and he was able to eat beef, mutton, oatmeal, eggs, dried fruits and a number of other foods without ill effect. In February, 1949, he developed urticaria after rolling in the grass; but extensive skin tests failed to incriminate any particular type of grass. Dr. Stening pointed out that at the time of the meeting the child was in excellent health and had been shown to illustrate the fact that children might be satisfactorily reared without any cow's milk. Attempts would be made soon to introduce cooked milk again. It was noteworthy that a brother had recently developed asthma, and that the patient had had several episodes suggestive of early respiratory allergy.

Diabetes Mellitus.

DR. R. A. R. GREEN showed a girl, aged ten years, suffering from *diabetes mellitus*. The patient was one of eleven children, the others all being normal; a great-uncle had had *diabetes mellitus*. At the age of seven years she had developed polyuria and a glucose tolerance test revealed that she was suffering from *diabetes mellitus*. Two months before her admission to hospital in February, 1949, she had been scalded with boiling milk, and since that time the degree of glycosuria had increased. On her admission to hospital she was found to be an underweight child with an abdomen protuberant in the upper half and a grossly enlarged liver extending to the umbilicus. She was having ten units of insulin twice a day and an 1100 Calorie diet. The diet was increased to 1900 Calories, and the insulin dosage left unaltered. The fasting blood sugar level was found to be extremely high. The child continued to have glycosuria while in hospital, and at the time of the meeting was receiving a 2200 Calorie diet with 28 units of insulin twice a day. She had gained nine pounds in weight in two months.

Subacute Myeloid Leuchæmia.

Dr. Green's second patient was a boy, who had first been admitted to hospital in June, 1948, at the age of seventeen months, with a history of pallor and an enlarged abdomen present for five months, a purpuric rash on the face present for one month, and a tendency to bruise easily. He had a cough and a variable appetite, and his abdomen seemed to be tender on examination. He was a pale child, with a fine petechial rash on the face and legs. The abdomen was protuberant, the liver, which was not tender, being palpable two fingers' breadth below the costal margin. The spleen was enlarged almost to the region of the umbilicus, and was firm and not tender. Dilated veins were visible on the abdominal wall. The tonsils were enlarged and red, the lymph glands in the neck, axillæ and supraclavicular and inguinal regions were enlarged. The total red blood cell count was 3,100,000 per cubic millimetre, and the hæmoglobin value was 7·5 grammes *per centum*. There were 32,900 leucocytes per cubic millimetre, of which 44% were neutrophile cells, 40% lymphocytes, 10% monocytes, 2% eosinophile cells, 1% metamyelocytes and 3% myelocytes. There were 310,000 thrombocytes per cubic millimetre. The results of Wassermann and Kline tests were negative. The fæces contained no abnormal constituents and no pathogenic organisms. X-ray examination of the long bones revealed no gross changes, but there was some thinning of the cortex, with streaky translucency suggesting early leuchæmic infiltration. Four ounces of blood were administered by transfusion. The child remained pale, the rash became more pronounced, and the spleen and lymph glands increased in size. A further blood count showed a slight alteration in the number of leucocytes, but the proportions remained constant. The child was discharged from hospital in August, 1948, with a diagnosis of unclassified leuchæmia. He was readmitted to hospital in October with a history of abdominal pain and vomiting and an increase in the size of the abdomen. The liver was found to be enlarged by three to four fingers' breadth below the costal margin, and the spleen was palpable at the level of the umbilicus. There was generalized glandular enlargement, and the tonsils were much enlarged. A tibial puncture was performed, and the total nucleated cell count was found to be 250,000 per cubic millimetre. The proportion of neutrophile cells was 26%, lymphocytes 10%, monocytes 1%, eosinophile cells 2%, metamyelocytes 3%, myelocytes 13%, myeloblasts 6%, small immature cells 28%, and nucleated red cells 3%. The count supported the diagnosis of myeloid leuchæmia. The child was discharged from hospital, but was readmitted three weeks later with an itchy rash and increased abdominal swelling. The tonsils were increased in size, and the spleen was enlarged to a level below the umbilicus. A course of deep X-ray therapy was given to the spleen twice a week in six doses, weekly blood counts being made. When discharged from hospital five weeks later, the child had a softer and smaller spleen. Two months later he was readmitted to hospital again, with gross enlargement of the spleen extending to the left iliac fossa. Blood transfusion and a course of deep X-ray therapy were given, and the spleen decreased in size. He was discharged from hospital at the beginning of March, 1949, only to be readmitted yet again on March 29 with a history of spitting up blood and melena of two days' duration. Severe bruising and bleeding of the gums were present. The spleen was palpable just below the umbilicus. The hæmoglobin value was 5·0 grammes *per centum*. He was given a transfusion of 400 millilitres of blood, and discharged from hospital one week later.

Renal Rickets.

DR. R. J. TAYLOR presented a boy, aged thirteen and a half years, suffering from renal rickets. The boy's birth weight had been four and a half pounds, and he had continued to be a small baby below the normal weight for his age. He had had measles at the age of eight years and tonsils and adenoids had been removed when he was aged ten and a half years. Otherwise he had been quite well until October, 1948, when he developed lassitude, difficulty in walking because of an abnormality of his ankles, pallor and anorexia. In January, 1949, he was admitted to the Kurri Kurri Hospital, where he remained for five weeks. X-ray and other investigations suggested a diagnosis of renal rickets. In February, 1949, he experienced an attack of vomiting on three consecutive mornings. He had occasional headaches and pains in the ankles. The amount and colour of his urine appeared to be normal. On examina-

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Time after administration.	Number of patients.	Average blood level.	Percentage of patients with blood level 0·03 or higher.
36 hours	182	0·076	97·3
48 hours	206	0·091	92·1
72 hours	190	0·077	93·2
96 hours	**173**	**0·057**	**86·7**

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tion the patient was seen to be a pale, undersized, underdeveloped, thin boy. His heart was not enlarged, and a faint apical systolic murmur was audible. His liver, spleen and kidneys were not palpable. Examination of his urine revealed 15 to 20 leucocytes per high-power microscopic field, but no casts were present; a profuse culture of enterococcus was grown. The blood urea content was 170 milligrammes per 100 millilitres. The serum calcium content was low (8·1 milligrammes *per centum*), and the serum phosphorus content was increased (10 milligrammes *per centum*). The results of Wassermann and Kline tests were negative. The urea concentration test revealed a fixed specific gravity and poor concentrating power. The *fundi oculorum* were found to be very light in colour; the optic disks were very pale, but the consultant was unable to be certain whether this was out of proportion to the general pallor of the fundi. The orthopædic consultant reported the presence of mild kyphoscoliosis and pronated feet. A blood count revealed 2,670,000 erythrocytes per cubic millimetre and a hæmoglobin value of 7·6 grammes *per centum*. The colour index was 0·97. The shape and colour of the erythrocytes were normal, and the majority were normal in size; occasional microcytes were present. The leucocytes numbered 11,300 per cubic millimetre, 51% being neutrophile cells, 37% lymphocytes, 2% monocytes and 10% eosinophile cells. Numerous thrombocytes were present. The following report was received on an excretion pyelogram: "At the end of two hours there is a faint concentration of dye in the bladder. There is insufficient in either kidney to show the calyces." The following report was received on X-ray examination of the bony skeleton:

> All bones show generalised osteoporosis with coarse trabeculation giving a stippled appearance. In the long bones there is widening of the epiphyseal lines, more marked in the hip, shoulder and ankle with loss of definition of the metaphysis and projection of coarse irregular bony strands into the epiphyseal cartilage. The skull shows widespread stippling with loss of definition of the tables and some thickening of the calvarium. The pelvis shows fluffy stippling with coarse trabeculation and widening of the sacro-iliac joints. These appearances are typical of renal rickets. The vertebræ showed generalised osteoporosis with coarse trabeculation causing the typical stippled appearance of renal rickets. Calcification of the epiphyseal plates is delayed.

Wilms's Tumour.

DR. S. E. J. ROBERTSON presented a girl, aged three and a half years, suffering from Wilms's tumour involving the right kidney. She had been admitted to hospital in March, 1949, with a history of increasing abdominal swelling, lassitude, loss of weight and anorexia, of two months' duration, and of slight jaundice, pale fæces and vomiting, of two days' duration. On examination of the patient, the abdomen was grossly enlarged, engorged veins being visible on the surface in its upper part. A large mass with a firm, irregular edge was present in the right hypochondrium, reaching below the umbilicus. The spleen was not palpable, and there was no enlargement of lymph glands. X-ray examination of the abdomen revealed that on the right side it was homogeneously opaque, and two-thirds of the left side were almost opaque. An excretion pyelogram revealed an extremely large tumour mass involving the right kidney; the left kidney appeared to be normal in size and shape. The major calyces in the right kidney were elongated and considerably displaced. The left renal pelvis and calyces appeared normal. The appearance was that of a right-sided neoplasm, and the diagnosis of Wilms's tumour was made. The results of Casoni tests were negative. Examination of the blood revealed a total of 3,600,000 erythrocytes per cubic millimetre, a hæmoglobin value of 10·7 grammes *per centum*, and a total leucocyte count of 22,800 per cubic millimetre, 77% being neutrophile cells, 15% lymphocytes and 8% monocytes. The urine contained albumin, occasional leucocytes and a moderate number of renal cells. While the child was in hospital the vomiting settled down and her condition was regarded as fair; but she continued to have intermittent pyrexia, and developed a cough. She was discharged from hospital two weeks after her admission.

DR. J. W. S. LAIDLEY presented a female child, aged eight years, who had been first brought to hospital in January, 1942, with a large swelling in the right kidney region, which was tender on palpation. A trace of blood was found in the urine. A diagnosis of Wilms's tumour was made. The following report was given on an excretion pyelogram: "Large mass obliterating all soft tissue details in right loin. No secretion visible on right side. Left kidney normal. P.D. Embryonic Carcinoma." Examination of the blood revealed a total of 2,320,000 erythrocytes per cubic millimetre, a hæmoglobin value of 42% (7·3 grammes *per centum*) and a colour index of 0·91; the erythrocytes were pale and microcytic, with pronounced anisocytosis. The leucocytes numbered 28,400 per cubic millimetre, 62% being neutrophile cells, 36% lymphocytes and 1% monocytes. A transfusion of four ounces of blood was given, with an appreciable improvement in the erythrocyte count and hæmoglobin value. Deep X-ray therapy was given to the right kidney region; the tumour became smaller and the child appeared brighter. A further transfusion of six ounces of blood was given, and two weeks after the conclusion of the deep X-ray therapy the right kidney with the tumour was removed. A further transfusion of four ounces of blood and a further course of deep X-ray therapy were given during convalescence. An X-ray examination of the chest about the middle of April showed increased lung markings, which it was thought might be metastases. However, the child remained very well, and after a further course of deep X-ray therapy was discharged from hospital towards the end of July, 1942. The pathologist reported that the tumour was kidney-shaped, with a lobulated, dark red and yellow surface. Mid-line section revealed thinned-out kidney substance forming part of a well-defined capsule. The substance of the tumour was made up of firm white tissue with small chocolate cysts. Microscopically all sections showed evidence of radiation change. There were scattered nests of cells of the nephroblastoma (Wilms's tumour) type. A nodule extracted from the renal vein was found to be an actively growing tumour. The pathologist considered at the time that the prognosis was poor.

Sacro-Coccygeal Tumour.

DR. E. H. GOULSTON presented a female baby, aged one month at the time of her admission to hospital in July, 1948, suffering from gastro-enteritis. At the time it was noticed that she had a large cystic swelling occupying the space between the anus and the coccyx; the mass was also palpable anteriorly above the pubis. Intravenous therapy was given for the gastro-enteritis, and during the period of treatment it was noticed that the passage of urine was most irregular, and that catheterization was required. A cystogram showed no abnormality of the bladder or pelvis, but there was congenital absence of the lower two segments of the coccyx. At the end of ten days the child's general condition had improved, the intravenous therapy was suspended, and she began to gain in weight. Shortly afterwards the urine became infected with *Bacillus coli communis*, and treatment with sulphadiazine was instituted. Nearly three weeks later, as catheterization was still being required, the urethra was dilated under general anæsthesia. The child then passed urine naturally for one month, when retention of urine again occurred. Urethral dilatation was repeated, with relief of symptoms, and again repeated three weeks later. A cystogram at this time showed that the bladder was displaced upwards and forwards, with some constriction of the neck. The deformity was caused by a large tumour in the pelvis. The urinary infection persisted until the beginning of November, when a course of phthalyl sulphathiazole was given with good effect. Three weeks later the cyst was removed under phthalyl sulphathiazole cover, and later penicillin was given. The child recovered slowly, and on discharge from hospital was gaining in weight. The pathologist reported that the tumour consisted of a mixture of fibrous, adipose, muscular and neural tissues and contained a number of epithelium-lined spaces. The epithelium varied in different portions and sometimes in different areas in the same cyst, but it was mainly of the ciliated columnar or cuboidal type. A diagnosis was made of mixed sacro-coccygeal tumour with malignancy.

Imperforate Anus.

Dr. Goulston's second patient was a boy, aged two years, who, at the time of his birth, had been found to have an imperforate anus represented by a dimple in the median raphe. X-ray examination at the time showed the presence of gas extending to two and a quarter inches from the dimple on the skin. On the following day meconium in very small amounts was passed *per urethram*, and on the same day left inguinal colostomy was performed. The bowel was opened two days later and functioned well. Two months later X-ray examination after injection of lipiodol into the lower end of the colostomy opening showed a minute opening to the anus from the lower end of the rectum. When the child was aged six months an artificial anus was made by incising the skin over the anal dimple and sewing the rectal wall to the skin edges. A rubber catheter was inserted from the colostomy to the anus and later removed. Twelve days after operation it was noticed that no fæces were being

passed *per urethram*. Subsequently the artificial anus was dilated regularly. However, it was noted that after dilatation blood was passed *per urethram*, and the presence of a recto-vesical fistula was presumed. Gentian violet injected into the lower end of the colostomy was passed in the urine. A laparotomy was performed, but no recto-vesical fistula was found. It was therefore presumed that the condition was a recto-urethral fistula. When the child was aged nine months the colostomy opening was closed; but three days later the large bowel became obstructed at the site of the closure. The wound was reopened and a tube was fixed in the proximal loop of bowel. The child's condition improved slowly, but fæces were passed *per rectum* and *per urethram* as well as through the colostomy opening. Two weeks later he was discharged from hospital with the colostomy acting and the wound around it closing. At the age of twelve months the colostomy opening was again closed. Fæces were passed *per rectum* and the fistula closed spontaneously. Three months later the child developed an anal stricture; the anus was dilated and the fibrous band causing the stricture was cut. Since that time the fæces had been passed normally *per rectum*. Occasional dilatation of the anus was still required.

Traumatic Carotid Thrombosis.

DR. J. STEIGRAD showed a boy, aged three years and four months, who at 10 o'clock on a morning in November, 1948, had fallen on a three-foot stick which he had in his mouth. No loss of consciousness occurred, but the child suffered from shock and slight blood loss. He was well all day, but restless during the night. At 8 o'clock the next morning the mother found him paralysed on the left side, and noticed that the left pupil was larger than the right. He was fully conscious and could swallow food. He was admitted to hospital on the same day, and was found to have a large ulcer on the right side of the hard palate above the right tonsillar fossa with surrounding œdema and œdema of the right side of the neck. There was a flaccid hemiparesis of the left side of the body, with paresis of the lower part of the face on the left side. The pupils reacted to light and accommodation. The cranial nerves were intact. The knee and ankle jerks and abdominal and cremaster reflexes were present on the right side and absent on the left. The plantar response was flexor on the right and extensor on the left. All other systems were normal. The swelling of the neck and ulcer in the mouth rapidly subsided. The left facial paresis began to diminish ten days after the child's admission to hospital. A degree of voluntary movement of the leg was noted two weeks later, and movement of the arm nine days later again. From that date on there had been a very slow improvement. At the time of the meeting the child was walking with the aid of a caliper and toe-raising spring. The left hand was splinted. Improvement seemed to be at a stationary stage. Some weakness of the left side of the face was still present, and the child had not yet regained full control of defæcation and micturition. X-ray examination of the skull had revealed no evidence of fracture. The cerebro-spinal fluid was normal, the Wassermann test produced no reaction, and the psychiatrist reported that the child was of normal intelligence.

Ectopia Vesicæ.

Dr. Steigrad's second patient was a boy, aged two and a half years, who had had an ectopic bladder since birth, and had urinated from the lower part of the abdominal wall. In February, 1949, the right ureter was transplanted into the sigmoid colon; convalescence was stormy for three days, but was followed by rapid recovery. One month later the left ureter was transplanted into the sigmoid colon, and convalescence was uneventful. On his discharge from hospital at the beginning of April, both wounds were well healed and the child was passing urine satisfactorily *per rectum*. On the occasion of both operations a cover was used of sulphadiazine, penicillin and streptomycin. Pre-operative preparation had consisted of a low residue diet and saline wash-outs. X-ray examination of the pelvis revealed wide separation in the neighbourhood of the *symphysis pubis*, due apparently to failure of bony development of the upper pubic rami.

Tuberculous Adenitis.

Dr. Steigrad's next patient was a girl, aged one year and nine months, who had been admitted to hospital in March, 1949, having had enlargement of the cervical lymph glands on the right side for fourteen weeks. The mass had been excised about eight weeks before her admission to hospital, and pus had been discharged subsequently for some time. She was an adopted child and had had no known contact with tuberculosis. On examination of the patient, a keloid scar was found at the angle of the jaw on the right side, and hard, painless enlargement of the right upper deep cervical glands was present. There was a reaction to the Mantoux test in a dilution of 1 in 1000. X-ray examination of the chest revealed no abnormality. The blood sedimentation rate was nine millilitres per hour. The total leucocyte count was 12,900 per cubic millimetre, and of these 4773 were neutrophile cells, 7482 lymphocytes, 387 monocytes and 253 eosinophile cells. The organism responsible for the infection was not recovered, but histologically the lesion was considered to be undoubtedly of tuberculous origin. Treatment was commenced with streptomycin, 20,000 units per pound of body weight per day being given by intramuscular injection twice a day. Six days later the keloid scar was excised and the tuberculous granulation tissue was curetted. Streptomycin therapy was discontinued two days later. One week later the wound was healed.

The second patient with tuberculous cervical adenitis presented by Dr. Steigrad was a boy, aged three and a half years, who had been admitted to hospital in February, 1948. Two weeks previously he had become feverish and refused food; three days later a swelling was noticed in the right side of the neck, which increased in size in spite of penicillin injections for a week. On examination of the patient, a punched-out ulcer was present on the upper part of the right side of the nose, with a small area of surrounding erythema. A mass of matted glands and several very firm discrete glands were present on the right side of the neck, with no fluctuation or erythema. There was slight enlargement of the left axillary gland and of the inguinal glands on both sides. The pharynx was moderately injected and the tonsils were enlarged. A reaction was obtained to the Mantoux test, with a dilution of 1 in 1000. X-ray examination of the chest revealed no evidence of a tuberculous lesion. Penicillin, 15,000 units every three hours, was given for one week without improvement. Twelve days after the child's admission to hospital, a cervical abscess was incised and thick yellow pus was obtained, which contained acid-fast bacilli. The overlying skin became further involved, and the glands fluctuant. Two weeks after the first incision four more abscesses were incised, thick yellowish-green pus being removed, and "Promin" jelly was instilled, the instillation being repeated twice a week for a further three weeks without improvement. At that point the administration of streptomycin, 100,000 units every four hours (that is, 20,000 units per pound weight per day), was begun and continued for fourteen days without any signs of toxicity. The sinuses closed during this period, and at its conclusion remained as surface crusts which were still present, but diminishing in size. During this period of treatment the tonsils and adenoids were removed. There was no histological evidence of tuberculosis in the tonsils. The ulcer on the nose was treated unsuccessfully with penicillin cream. Later "Promin" jelly was used, and the ulcer became dry and crusted after a few weeks' treatment. The child was discharged from hospital at the end of April, 1948, to be readmitted eleven days later with discharging sinuses. After the further administration of streptomycin, the discharge from the sinuses ceased. The child was again admitted to hospital in November, 1948, when examination revealed the scars of the previous operations and a small palpable right submandibular gland. The lesion on the face had healed. The gland was removed, and the wound healed well.

Laryngeal Papilloma.

DR. N. H. MEACLE presented a girl, aged three years, who had been well and cried lustily with a normal voice until the age of twelve months. Then over a period of one month she gradually lost her voice and developed almost complete aphonia, which was most pronounced when she was excited. Slight improvement followed removal of tonsils and adenoids. Later, however, chest recession and respiratory difficulty occurred, and after two days she was admitted to hospital. On examination of the patient, her colour was good, but she had considerable rib recession and sternal recession, and there was audible respiratory effort. Part of a laryngeal papilloma was removed through a laryngoscope without anæsthesia, and she was put in a steam tent after operation. On the following day more pieces of papilloma were removed without anæsthesia, with relief. The child was then quite comfortable, with a good colour and no rib recession, and was discharged from hospital to report if further respiratory difficulty occurred. She was readmitted three months later with a history of losing her breath and audible respiration at night. On examination of the patient, stridor and chest recession were present, and her colour was slightly cyanosed. Part of a papilloma was removed through a laryngoscope without anæsthesia, the breathing became quieter, and the child was discharged

from hospital to report again in two weeks' time. At the end of the two weeks there was little respiratory distress, and her colour was good. An anæsthetic was given, and part of a papilloma which mainly involved the right cord was removed. After operation she was put into a steam tent for three hours.

Œsophageal Stenosis.

Dr. Meacle's second patient was a girl, who had first been admitted to hospital in May, 1939, at the age of one year and nine months. She had had vomiting attacks after every meal for six months. She was then thin and wasted, but clinical and X-ray examinations revealed no abnormality. She continued to have effortless vomiting after food while in hospital, and then developed measles and pneumonia and was very ill. Vomiting was so persistent that fluids had to be given intravenously after the attack of measles. Her condition varied, but she was discharged from hospital in August, 1940, with only occasional vomiting, and gaining a little in weight. She was treated with sedatives, belladonna and "Eumydrin". She was again admitted to hospital in March, 1949, with the history that she had had intermittent vomiting for four years. Substernal pain, vomiting, anorexia and severe weight loss had occurred in the previous two weeks. On examination of the patient, she was very emaciated and under-developed, with poor muscle tone. There were cracks at the corners of her mouth and her calves were tender; otherwise no abnormalities were found. She vomited frequently after her admission to hospital, and intravenous therapy was commenced with glucose and saline, dextrose in distilled water and "Casydrol". Examination of the blood revealed a moderate degree of anæmia. X-ray examination after ingestion of a barium bolus revealed almost complete stenosis of the œsophagus at the level of the sixth thoracic vertebra, more than an inch below the level of the aortic arch. Insufficient barium passed through the stricture to allow satisfactory examination of the stomach. Œsophagoscopy was performed, and the stricture was dilated under anæsthesia. Vomiting ceased and the child began to take fluids. After two further dilatations the child was able to take the ward diet without difficulty, and no further vomiting occurred. She gained in weight and was discharged from hospital four months after the first œsophagoscopy.

Tuberculous Meningitis and Tuberculous Disease of the Spine.

DR. W. L. MACDONALD presented a girl, aged two and a half years, who, until Christmas, 1947, had been well. At that time she was noticed to stoop, and she began to have frequent attacks of abdominal pain with extreme irritability and listlessness during the attacks. Loss of weight occurred. On her admission to hospital in May, 1948, X-ray examination confirmed the diagnosis of tuberculous disease of the spine in the thoracic region. The spine was quite rigid, with pronounced kyphosis in the region of the seventh to the ninth thoracic vertebræ. A paravertebral abscess was also discovered, which slowly resolved. A plaster back splint with headpiece was used to immobilize and support the spine. In August, 1948, the patient developed rubella, which subsided with a normal convalescence. Her condition progressed uneventfully until February, 1949, when her temperature rose; on the next day she vomited, and a day later she became drowsy. No physical signs were found on examination, but mild pyrexia continued, with drowsiness and occasional vomiting. One week after the onset of symptoms, lumbar puncture was performed, and clear fluid was obtained. Streptomycin, 50,000 units, was given intrathecally. Although there was no neck rigidity, tuberculous meningitis was suspected. The intrathecal injection of streptomycin, 50,000 units, was repeated daily for one month. Simultaneously streptomycin was given intramuscularly in a dosage of 20,000 units per pound of body weight per twenty-four hours. The latter was being continued. Weekly lumbar punctures as a routine check on progress were still being carried out. Dr. MacDonald said that, although there were still indications of the presence of tubercle bacilli in the cerebro-spinal fluid as shown by the guinea-pig test, the patient was well and convalescence was proceeding satisfactorily. No affection of the mentality had been noted.

Bronchiectasis.

A series of patients suffering from bronchiectasis were presented by the Bronchiectasis Committee.

The first patient, a boy, aged twelve years, had had what was described as "a cold" since the age of two weeks, with failure to thrive. He had been treated at the Royal Alexandra Hospital for Children in 1937 for pertussis, and again in 1938 for a cough and cyanotic attacks; radiotherapy was given for thymic enlargement, with improvement in his condition. In November, 1946, when admitted to hospital for his present condition, he had had two attacks of hæmoptysis and had a continuous loose and "slushy" cough. His general condition was good, and a bronchogram revealed evidence of bronchiectasis at the base of the right lung. He was treated with penicillin, postural drill and breathing exercises. In November, 1947, he was considered to be a suitable subject for surgery, and right lower lobectomy was performed. The diagnosis of bronchiectasis was confirmed pathologically. He had remained very well since, had gained in weight, and clinically his chest was normal; he had no cough or sputum. He had had no recent treatment and was considered at the time of the meeting to be cured.

The second child, a boy, aged seven years, had had persistent cough since suffering from pink disease and pertussis beginning at the age of nine months. He was treated with postural drill, breathing exercises and sulphathiazole for eighteen months, with improvement in his general health. Tonsillectomy, with removal of adenoids, was carried out in February, 1947; since then he had had no nasal symptoms and less evidence of upper respiratory tract infection. On examination in August, 1948, the patient's nutritional state was considered to be only fair. He had no chest deformity, but finger clubbing and abnormal signs at the lung bases, especially on the left side, were present. A bronchogram in February, 1947, had revealed pronounced bronchiectasis at the base of the left lung posteriorly, and probable evidence of the same condition at the base of the right lung. In September, 1948, the condition on the left side was unchanged, but there was involvement of the lower lobe of the right lung. He was treated with postural drill, breathing exercises and sulphathiazole from February, 1947, to September, 1948, when it was decided that his condition should be reviewed twelve months later. It was considered that surgical treatment applied to the lower lobe of the left lung and the lingula would almost certainly be advised, and that he required pre-operative improvement in his general nutrition.

The last two patients, boys, aged nine years and ten years eleven months respectively, had had persistent cough since they had suffered from bronchitis during the teething period. In both cases nutrition was poor, and bronchography revealed evidence of bronchiectasis, in one case involving the lower lobe and lingula of the left lung, and in the other the lower lobes of both lungs. In one case a diagnosis was made of saccular left basal bronchiectasis with bronchitis, and the patient was treated with penicillin inhalations, a daily dosage of 30,000 units, for one month, bronchoscopic suction every week for one month, and then every month for six months, with postural drill and breathing exercises. In the other case the diagnosis was one of double basal bronchiectasis with evidence of asthmatic bronchitis, and the patient was admitted to hospital for postural drill, breathing exercises, weekly bronchoscopic suction and aerosol penicillin inhalations; at the end of one month he was to be discharged from hospital to have monthly bronchoscopic suction, and his condition was to be reviewed in four months.

A MEETING of the Victorian Branch of the British Medical Association was held at Bendigo on Saturday, May 7, 1949, the President, DR. DOUGLAS THOMAS, in the chair. The afternoon session took the form of a series of clinical demonstrations by members of the medical staff at the Bendigo Base Hospital. At the evening session DR. T. A. LOWE, Director of Medical Research at the Baker Institute, Melbourne, delivered an address on various tests of renal function with especial reference to the applicability and suitability of each of the tests in various pathological conditions in which it was suspected that the kidneys were diseased.

Double Uterus and Double Vagina.

DR. JEAN GRANT showed a married woman, aged thirty-four years, and discussed some of the gynæcological and obstetrical complications arising out of the presence of a double uterus and double vagina. She said that the patient had been married at the age of twenty-two years and for six years the menses had been relatively normal, but in the subsequent two years she was amenorrhœic and under treatment before she became pregnant. She aborted when it was believed that she had been pregnant for five months, but no fœtus was found, though placental tissue was present in the products, which were only such as would be expected at about two and a half months. The patient was told that she was still pregnant, but had a second uterus, and it was then ascertained that her mother also had a double uterus. The undisturbed pregnancy went on to term and labour

started in the middle of a certain night. Dr. Grant described how, twelve hours later, when the head was on the perineum, she had attempted a pelvic examination, but had entered what she afterwards realized was the wrong vagina, a mere slit passing upwards beside the head; at its upper limit an undilated cervix was felt. A classical Cæsarean section was performed on the assumption that the head was pushing the lower uterine segment in front of it through the pelvis. The baby had harelip and cleft palate, which were repaired in due course, but only one vagina. On the day after delivery a speculum was inserted, but, again, into the wrong vagina; the presence of the second vagina was realized when during the manipulations some blood-stained discharge appeared at the vulva. Dr. Grant added that, in a recent American medical journal, the paucity of descriptions of cases of the kind was deplored; the loss of the other fœtus was just bad luck, but the failure to discover the second vagina had made it necessary to operate.

DR. W. R. D. GRIFFITHS said that he had seen two similar patients; one was seen with Dr. Sloss about 1930 and abortion occurred at five months; the other case was complicated with syphilis, and the late Dr. R. W. Chambers had reconstructed one uterus from two halves of the double uterus. Dr. Griffiths added that he had on several occasions made one vagina out of the remnants of two. He went on to say that he understood that if pregnancy occurred in one uterus, the other enlarged and was liable to embarrass delivery as much as a fibroid tumour would and that, as the patient was still young, operative reconstruction should be considered.

DR. ROBERT SOUTHBY commented on the great interest of associated developmental anomalies and wondered whether, in the case under discussion, the anomalies in successive generations were interrelated.

Dr. Grant thanked Dr. Griffiths for his suggestion and then repeated that the patient's mother had also had double uterus, but the vagina was definitely not double.

Brucellosis.

DR. J. LONG showed a married woman, aged thirty years, who had made a complete recovery from a prolonged pyrexia of unknown origin for which he thought that brucellosis was the most likely diagnosis. She had had a long feverish illness with vomiting when only three years of age and had had an attack of rheumatic fever in April, 1930, during her second year of training as a nurse and a recurrence in March, 1940. However, she completed her training, was married in 1945, and became pregnant in the following June, the pregnancy being associated with severe vomiting from the start; during the second and third months she was in hospital at Williamstown and the vomiting was ascribed to gall-bladder trouble, the presence of which was supported by radiological evidence; complete abortion at five months had ended that pregnancy.

Dr. Long then recounted the details of a second pregnancy, complicated by hyperemesis for six months, which resulted in the normal birth of a healthy child on January 8, 1947, and of the commencement of another pregnancy in October, 1948, with the usual trouble from vomiting. The patient was admitted to hospital on January 7, 1949, with free bleeding and severe shock, which was overcome by the introduction of a litre of serum, and she was discharged from hospital on January 18. Dr. Long had visited her again on January 27, as bleeding had started again, and, on examining her, found the uterus to be much smaller than it should have been; at curettage under anæsthesia in the private hospital about one ounce of stale debris was removed. On the following day the patient complained of joint pains and was nauseated and vomited. Next day she had headache, pains in the chest and vomiting, but the lochia were quite satisfactory. As the temperature and pulse and respiratory rates were rising, 50,000 units of penicillin were injected every six hours. That night she had the first rigor and next day all the signs and symptoms were more pronounced, but there was not any evidence of pneumonia or of lochial sepsis. It was soon realized that penicillin was not controlling the unknown infection, and sulphathiazole was used six-hourly together with continuous rectal drip therapy. From the fourth day onwards, Dr. Long said, he had had the advantage of frequent consultations with Dr. Philip Goodman, and, for the next week, the severity of the illness was abated considerably; the vomiting stopped and the headache and joint and body pains were much milder; the oral administration of sulphathiazole was continued. During that week laboratory aids to diagnosis were invoked, and it was reported that, apart from moderate secondary anæmia, the blood films were normal; the leucocytes numbered 7600 per cubic millimetre; the blood was sterile; the result of the Kline test was positive; the serum did not agglutinate the organisms of typhoid or paratyphoid or Brucella; there were 40 red blood cells per high-power field when the urine was examined microscopically, and it, too, was sterile when culture was attempted; the radiological appearance of the chest was within the limits of normality, and the fluid from an antral washout was clear. By the fourteenth day they had come to the conclusion that they were dealing with a virus disease, and "S.U.P. 36" was given to the patient for three days without benefit; the blood picture was unchanged though the leucocyte count rose to 8200 per cubic millimetre; the Kline reaction of her serum was weaker, and it was absent from her husband's serum; her serum failed again to agglutinate Brucella, Proteus or organisms of the typhoid group. Lumbar puncture was performed, but the cerebrospinal fluid was normal; it failed to yield the Kline reaction An attempt to cultivate pathogens from the fæces also failed. Dr. Long went on to say that, as there were not any localizing signs, they felt sure that they were dealing with a general infection which was most likely to be brucellosis, and they tried to obtain a supply of streptomycin, but it was then unavailable to them. They decided to use large doses of penicillin, and the patient was given 150,000 units every four hours for eight days; then the dose was halved for six days, at the end of which the use of penicillin was discontinued because the patient had recovered and had been normal for a week.

DR. DOUGLAS THOMAS opened the discussion by stating that he was particularly interested in brucellosis; he had three patients with the condition in his wards at the Royal Melbourne Hospital and had had four others there in 1948. The diagnosis was proved by blood culture and an agglutination titre in the range of one part in 2500 or 3000. A point of public interest was the fact that the disease had become a notifiable one in Victoria only during the past few years and that inoculation of cattle with strain 19, which had cleared the condition up in Tasmania, had been in operation in Victoria only very recently; it was estimated that about 65% of the Victorian herds were infected. Dr. Thomas remarked that, in the case under discussion, the diagnosis had not yet been established, but the serum should be tested again and the agglutination titre ascertained to see if it was significant. He added that the bacteriæmia was of very short duration in brucellosis, but the titre of agglutination persisted and the organisms remained somewhere in the reticulo-endothelial system. Two of his own patients had been admitted to hospital with the provisional diagnosis of infective hepatitis, and "liver stabs" were helpful in establishing the correct diagnosis. He thought it would be wise for Dr. Long to give the patient about one gramme of streptomycin daily in divided dosage for a while, in spite of the apparent recovery, if the diagnosis was proved by agglutination, which he undertook to arrange in Melbourne if he was supplied with a suitable fresh specimen of serum.

DR. ROY WATSON said that from a study of the charts and of the history the condition could have been a pelvic cellulitis, though leucocytosis would have been expected; the investigations had been thorough and no positive evidence of brucellosis was adduced, apart from the abortion itself; had cervical swab cultures been made, streptococci might have been grown.

DR. PHILIP GOODMAN reported that the uterus had not been enlarged during the illness and no tenderness of the uterus or of the adjacent structures had been manifested. He was aware that brucellosis was not usually cured by penicillin, but he knew of two cases in males in which the Kline reaction was present and the results of agglutination tests were negative and in which cure of pyrexia of unknown origin had been effected by the use of one million units of penicillin daily.

Dr. Thomas, from the chair, remarked that penicillin cured some strains of Brucella infection and that false Kline and Wassermann reactions were known in that condition.

DR. J. E. SEWELL said that he had seen a patient with Brucella infection early in 1948 and that, after three months, the temperature came down and the patient recovered without streptomycin therapy; it was difficult to know whether there was a certain specific cure for brucellosis; it might be a self-limited condition. He added that he was in agreement with Dr. Watson's suggestion that septicæmia of uterine origin might have been the cause of the illness under discussion.

Dr. Thomas said that many people recovered spontaneously as positive agglutination titres were commonly encountered among controls; it was the range of the titre that was significant in the diagnosis of a febrile illness.

(To be continued.)

Correspondence.

A NATIONAL HEALTH SERVICE.

SIR: At the annual general meeting of the Central Southern Medical Association today we discussed, among other matters, the National Health Insurance Scheme. As regards payment of 50% of medical fees by the Commonwealth Government, the following method of refunding payments to patients was suggested.

The community may be roughly divided into two classes: (i) those who, by reason of age, infirmity *et cetera*, do not pay income tax, and (ii) those who do pay income tax.

Re class (i)—invalid and old-age pensioners *et cetera*. These people are actually not in a position to pay even 50% of medical fees, and it was felt that they could be adequately covered by the Department of Social Services paying quarterly fees, on a lodge basis, to the doctor of their choice.

Re class (ii). When rendering their income tax returns, all receipts for medical fees should be sent therewith. Of the total amount, with perhaps a set maximum limit, 50% should be a rebatable allowance, as at present. The remaining 50%, which would be the proportion payable by the Commonwealth Government, would be allowed as a straight-out deduction from the assessed income tax. In the event of this amount exceeding the tax assessment, a refund would have to be made to the taxpayer.

This method has the advantage of simplicity and economy in regard to government administration, as practically all the necessary book-keeping *et cetera* is already being done by the Taxation Department.

From the viewpoint of medical politics, if it were publicly advocated by the British Medical Association and the Commonwealth Government refused to cooperate, then the inference would be that the present complicated scheme is, in truth, the initial step in regimentation or nationalization of the medical profession, in spite of government protestations to the contrary.

Yours, etc.,

ALLEN G. WISE,
President, Central Southern Medical Association.

Arthur Street,
Moss Vale,
New South Wales.
May 2, 1949.

PULMONARY EMBOLUS: A SUGGESTION.

SIR: Pulmonary embolus occurs but rarely in children—a very wide statement, and one I cannot make on my own authority as in my practice I see but few children.

Visiting a children's ward recently, I was struck by the various attitudes adopted by the children, some of whom were asleep, and, as at this time my mind was on the subject of pulmonary embolus and the relationship to it of early mobility, the thought came to inquire how often children were affected by it. On inquiring, I was told that there had never been a case in the department. Wondering if this was merely fortunate or fortuitous, I questioned Dr. H. Douglas Stephens, who has had an enormous experience with the surgery of children, and he told me that he had not seen a case of pulmonary embolus in a child. I then made further inquiries at the Children's Hospital and elicited the information that the superintendent had no knowledge of any case and that Dr. R. Webster, who has been pathologist there for thirty years, had not seen a case. Truly, all this may have been accidental or coincidental, but I have thought the matter worth much consideration, and now offer an explanatory hypothesis with some suggestions for its application. Two sets of phenomena appear to me to be reconcilable and to form a basis for this hypothesis. Firstly, a child does not keep still in bed, nor does it sleep lying flat on its back. It rolls and wriggles and sleeps in whatever position it finds most comfortable. It also does the same whilst recovering from an anæsthetic. Secondly, outstanding amongst the facts known of this dread accident is that it is almost constantly associated with non-inflammatory clotting in the deep veins of the calf of the leg. Now why should adults get this phlebothrombosis and children not? My explanation is that the attitude adopted by adults during operation, during recovery from anæsthesia, general or spinal, and during the deep sleep induced by morphine, barbiturates *et cetera*, may be responsible. This position is one of lying flat on the back, the calves of the legs being flat on the operating table or on the bed. The weight of an adult's legs lying thus, each with its muscle in a flaccid state, would be sufficient to block or diminish the flow of blood in the deep veins. Blockage or diminution of the blood flow in these veins at a time when one would expect thrombogenic substances to be in the circulation could, I think, lead to the formation of these clots, so commonly found at the autopsy in a case of pulmonary embolus. This theory, of course, may be quite erroneous, but a practical application to test its value is simple, is available everywhere and involves no expensive drugs, nor the need of any biochemical tests. My practical application of this hypothesis is to position all patients in such a manner that there will be no obstruction to the blood flow in the deep leg veins.

Firstly, lay patients on the operating table in the "frog position", that is, with the knees slightly flexed and the hips rotated outwards, the position being maintained by fixing of the feet so that the heels are touching each other. A sandbag or similar apparatus is placed against the soles of the feet so as to prevent the knees becoming fully extended. In this way the calves of the legs are kept from lying flat on the table. Here it is of interest to note that young children under general anæsthesia assume this position without assistance. I realize that the same result can be obtained by merely putting a sandbag under the heels, but consider that the hyperextension of the knee produced when the muscles become flaccid is not desirable. The other position assures the same result without the undesirable hyperextension of the knees.

Secondly, when the patient returns to his bed he is not allowed to lie flat on his back whilst unconscious either during recovery from anæsthesia or during sleep, but is placed and kept lying on his side.

I have started this with my own patients and some friends have agreed to try it with me, but, as pulmonary embolus occurs with such uncertainty, any real value in the suggested method could only be ascertained if it were tried on a large scale. This would involve many men doing it. If people with laboratory facilities for the investigation of clotting time and prothrombin time could investigate two series, one with the suggested method and a control with the existing methods, valuable information might be obtained more rapidly.

If there is anything of value in the suggestion it may also explain what to me have been some mysteries. The first is the frequency with which pulmonary embolus occurs after operations for inguinal hernia. I now think that the unexpectedly high incidence following this simple procedure may be due to the precautions taken to prevent the sutures breaking by keeping the patient particularly still in bed. The second mystery that may be explained is the failure of spinal and local anæsthesia to prevent the incidence of post-operative pulmonary complications, most of which are probably embolic in origin. Another aspect that requires some explanation is the failure of early ambulation as a complete preventative, and this would seem to place the formation of the clots in the pre-ambulatory period. The suggestion offered is that the first clotting, on which the subsequent clots are formed, occurs during or shortly after operation whilst the patient is lying flat on his back.

The hope of avoiding this calamity by the use of such an easy method may be wishful thinking, but it seems to me that it would be a pity not to find out definitely if such simple treatment could reduce the incidence of pulmonary embolus with its morbidity and occasional dramatic mortality.

Yours, etc.,

LEO DOYLE.

45 Spring Street,
Melbourne,
January 21, 1949.

THE PHARMACEUTICAL BENEFITS ACT.

SIR: Members of the profession have doubtless observed repeated statements by Federal Ministers, notably Senator McKenna, implying that the non-cooperation of the vast majority of the profession in *The Pharmaceutical Benefits Act* has been dictated by the Federal Council. Statements of this kind were reported in THE MEDICAL JOURNAL OF AUSTRALIA of May 14, 1949. Members will remember that it was stated by Senator McKenna that the Federal Council had actually instructed members not to cooperate. Every member of the Association is well aware that those statements are not true. It may well be that some members of the public do not know the truth of the matter. That Senator McKenna himself well knows the truth is borne out by the following words taken from the official report of the conference between himself and the Federal Council

on April 21, 1947. The words are those of Senator McKenna himself and they were addressed during the conference to Sir Henry Newland:

> The last matter concerns the powers of your Federal Council. My attention was directed to an article by Dr. Lee, I think, of your Council in "The Medical Journal" last year sometime, in which he raised the point that your Council had no power to bind the profession generally. On what you have put before me, I concede to you instantly that your body should be the body to present the views of the medical profession in Australia, and I meet you very readily on that basis.
>
> So far as the implementing of any agreements that we make or any undertakings with your Council are concerned, the position I found some time ago was that you had no power to bind the Branches in the various States unless they had conferred specific authority on you to do so. That left me with some doubt and hesitation. From a government viewpoint, it is highly desirable when a body representing a profession and the Government come together that the profession and Government should be bound.
>
> I understand that you have taken steps to reconstitute your Federal Council; you have added more numbers; and that you have reached some kind of working arrangement with the various Branches throughout Australia. It is machinery. However, I understand that does not bind the Branches and does not bind the members.
>
> I am just putting this proposition to you; the Government and your Council will, I hope, be having quite a number of conferences in the reasonably near future. If your Council were to get itself to a position where having spoken and having dealt with the Government a matter was resolved, you can realize what a vast convenience that is going to be. I am not going to make any suggestions to you at all as to what you should do. That is entirely a matter for yourselves and for your Branches. But I just direct your attention to that position, and your Council has already given thought to it.

Attention is specially directed to the words of the last quoted paragraph from which the inference is clear that not only did the Minister know that the Federal Council has no power to instruct members, but that he actually suggested to it that it should "get itself to a position" to do so.

It is felt by the Publicity Committee of the Federal Council that members should take every opportunity of making these facts known to patients.

Yours, etc.,

J. H. PRIESTLEY,
Assistant General Secretary,
Federal Council, on behalf
of the Federal Council
Publicity Committee.

135 Macquarie Street,
Sydney,
May 24, 1949.

Obituary.

WILLIAM JOSEPH FORSHAW.

WE regret to announce the death of Dr. William Joseph Forshaw, which occurred on April 10, 1949, at Orbost, Victoria.

Public Health.

POLICE OFFENCES (AMENDMENT) ACT, 1908, AS AMENDED—WITHDRAWAL OF AUTHORITY TO BE IN POSSESSION OF DRUGS.

THE following notice has appeared in the *New South Wales Government Gazette*, Number 75, of May 6, 1949.

It is hereby notified for general information that under the provisions of Regulation No. 25 of the *Police Offences (Amendment) Act*, 1908, as amended, the authority of Dr. Joseph Roy Baker, Dorchester, 149 Macquarie Street, Sydney, to procure and be in possession of drugs to which the Act applies for the purpose of his profession and to issue prescriptions for such drugs, is withdrawn as on and from the 23rd May, 1949.

J. M. BADDELEY,
Chief Secretary's Department.

Sydney,
May 23, 1949.

Diary for the Month.

JUNE 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 9.—South Australian Branch, B.M.A.: Clinical Meeting.
JUNE 9.—Victorian Branch, B.M.A.: Organization Subcommitee.
JUNE 10.—Queensland Branch, B.M.A.: Council Meeting.
JUNE 13.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
JUNE 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 15.—Western Australian Branch, B.M.A.: General Meeting.
JUNE 16.—Victorian Branch, B.M.A.: Executive Meeting.
JUNE 21.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester United Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

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